System Overview

BCM 5.0

Business Communications Manager

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NORTEL

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Chapter 1
Getting started

The information in this chapter applies to both the BCM50 and the BCM450 platforms running BCM 5.0.

About this guide

This system overview gives a high-level understanding of the core capabilities and features of Nortel Business Communications Manager (BCM) 5.0.

Audience

This overview is for installers, network administrators, and others who are interested in the BCM.

Acronyms

Following is a list of acronyms used in this guide.

Acronym	Description
ADID	Analog direct inward dial
AMIS	Audio Messaging Interchange Specification
APAC	Asia Pacific
BCM	Business Communication Manager
BFT	Base function tray
BRI	Basic Rate Interface
CALA	Caribbean and Latin America
CCR	Custom call routing
CDR	Call Detail Recording
CEC	Capacity expansion card
CIM	Common information model
CTI	Computer telephony integration
DDC	Dynamic device configuration
DMTF	Distributed Management Task Force
DN	Directory number
DTMF	Dual-tone multi frequency

Acronym	Description
FEM	Fiber expansion module
FRU	Field replacable unit
GASI	Global Analog Station Interface
GASM	Global Analog Station Module
GATI	Global Analog Trunk Interface
GATM	Global Analog Trunk Module
GNPS	Global Network Product Support
HDD	Hard disk drive
ICC	Intelligent Contact Center
ICCL	ISDN call connection limit
IP	Internet Protocol
ISDN	Integrated services digital network
KEM	Key expansion module
LAN CTE	Local area network computer telephony engine
MBM	Media bay module
MCDN	Meridian customer defined network
MIB	Management information base
MWI	Message waiting indication
NCM	Network Configuration Manager
NCRI	Network call redirection info
OS	Operating system
POST	Power on Self Test
PSTN	Public switched telephone network
PVQM	Proactive voice quality monitoring
QoE	Quality of Experience
SFTP	Secure File Transfer Protocol
SIP	Session Initiated Protocol
SNMP	Simple Network Management Protocol
VoIP	Voice over Internet Protocol
VPIM	Voice profile for internet mail

Related publications

This section provides a list of additional documents.

Nortel Business Communications Manager 450 5.0 Installation—System (NN40170-303)

Nortel Business Communications Manager 450 5.0 Maintenance (NN40170-503)

Nortel Business Communications Manager 50 5.0 Installation and Maintenance Guide (NN40170-305)

Nortel Business Communications Manager 5.0 Upgrade Guide (NN40170-401)

Nortel Business Communications Manager 5.0 Installation—Devices (NN40170-304)

Nortel Business Communications Manager 5.0 Configuration—System (NN40160-501)

Nortel Business Communications Manager 5.0 Configuration—Devices (NN40160-500)

Nortel Business Communications Manager 5.0 Configuration—Telephony (NN40160-502)

Nortel Business Communications Manager 5.0 Planning and Engineering (NN40160-200)

Nortel Business Communications Manager 5.0 Administration and Security (NN40160-601)

Nortel Business Communications Manager 5.0 Fault and Performance Management (NN40160-701)

Unified Messaging Configuration Guide (NN40080-501)

CallPilot Fax Set Up and Operation Guide (NN40080-301)

CallPilot Message Networking Set Up and Operation Guide (NN40090-301)

Personal Call Manager User Guide (NN40020-103)

Intelligent Contact Center Set Up and Operation Guide (NN40040-301)

LAN CTE Configuration Guide (NN40020-602)

Call Detail Recording System Administration Guide (NN40020-605)

Personal Call Manger User Guide (NN40010-104)

Activity Reporter Administration Guide (NN40010-627)

Activity Reporter User Guide (NN40010-112)

InTouch Administration Guide

InTouch User Guide

Nortel Business Communications Manager Find Me/Follow Me Administration Guide (NN40010-678)

Nortel Business Communications Manager Find Me/Follow Me Administration Guide (NN40010-118)

How to get help

This section explains how to get help for Nortel products and services.

Getting Help from the Nortel Web site

The best way to get technical support for Nortel products is from the Nortel Technical Support Web site:

www.nortel.com/support

This site provides quick access to software, documentation, bulletins, and tools to address issues with Nortel products. More specifically, the site enables you to:

- download software, documentation, and product bulletins
- search the Technical Support Web site and the Nortel Knowledge Base for answers to technical issues
- sign up for automatic notification of new software and documentation for Nortel equipment
- open and manage technical support cases

Getting Help over the phone from a Nortel Solutions Center

If you don't find the information you require on the Nortel Technical Support Web site, and have a Nortel support contract, you can also get help over the phone from a Nortel Solutions Center.

In North America, call 1-800-4NORTEL (1-800-466-7835).

Outside North America, go to the following Web site to obtain the phone number for your region:

www.nortel.com/callus

Getting Help from a specialist by using an Express Routing Code

To access some Nortel Technical Solutions Centers, you can use an Express Routing Code (ERC) to quickly route your call to a specialist in your Nortel product or service. To locate the ERC for your product or service, go to:

www.nortel.com/erc

Getting Help through a Nortel distributor or reseller

If you purchased a service contract for your Nortel product from a distributor or authorized reseller, contact the technical support staff for that distributor or reseller.

Chapter 2
BCM450 hardware

The information in this chapter applies to the BCM450 platform running BCM 5.0.

The Business Communications Manager provides private network and telephony management capability to small- and medium-sized businesses.

BCM is a complete, converged voice, and feature-rich business telephony applications solution for small business and small enterprise branch offices. BCM gives you the features and applications of traditional small office PBX and key systems plus the converged value of IP.

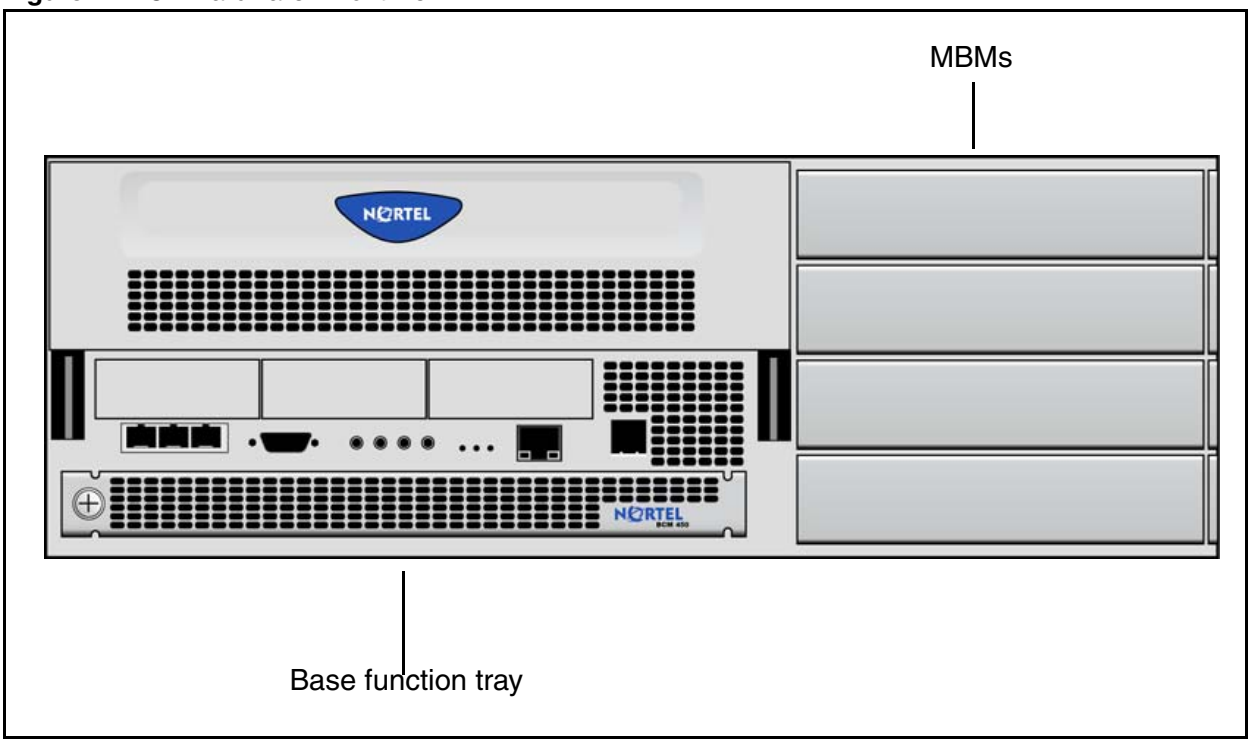
This release of BCM introduces the following enhancements:

- set templates
- parameter renumbering
- Network Configuration Manager (NCM) 5.0

For more information, see "BCM features" on page 33.

BCM (as shown in Figure 1"BCM hardware—front view" (page 11)) features a new base function tray.

Figure 1 BCM hardware—front view



For more information about BCM hardware, see *Nortel Business Communications Manager 450 5.0 Installation—System* (NN40170-303).

BCM main unit

The primary hardware component of your BCM450 system is the main unit. Each BCM450 system must have one main unit. The main unit houses the base function tray (BFT) and has four slots for media bay modules (MBM).

You can connect your BCM450 system directly to a power source or through an optional uninterruptible power supply (UPS).

The BCM450 main unit provides call processing functions. The BFT, which is housed in the main unit, provides four connections for auxiliary equipment (auxiliary ringer, page relay, page output, and music source). The BCM450 main unit has no router, but it has two LAN ports and one OAM port. The main unit includes four slots for MBMs, and supports up to one fiber expansion module (FEM) MBM for connecting N* expansion modules. For more information the FEM, refer to *Nortel Business Communications Manager 450 5.0 Installation—System* (NN40170-303).

A main unit contains the following field-replaceable units:

- cooling fan
- power supply unit
- base function tray (BFT)
- hard disk drive (HDD)
- up to four MBMs
- optional capacity expansion card (CEC)

Additional BCM hardware

In addition to a main unit, the BCM450 system can include a BCM450 expansion cabinet. An expansion cabinet connects to the main unit and provides additional functionality through one or more installed media bay modules (MBM).

The BCM expansion cabinet accommodates the MBMs used by other BCM platforms. The BCM main unit can support one expansion cabinet. For more information, see “BCM expansion cabinet or unit and media bay modules” on page 29.

BCM450 also supports an optional secondary power supply and fan, as well as an optional secondary hard disk drive for RAID disk mirroring. For more information about installing a redundant power supply or hard disk drive, see Nortel Business Communications Manager 450 5.0 Installation—Maintenance (NN40170-503)

The BCM450 is available with the following mounting options:

- rack-mount (standard 19-inch rack)
- stand-alone (feet included);
- wall-mount (optional wall-mount bracket available separately)

The wall-mount bracket is an inexpensive bracket for mounting the BCM or expansion cabinet to a wall; for more information, see “Mounting kits” on page 30.

You can rack-mount a maximum of four BCM systems directly into a standard 19-inch rack. For more information, see “Mounting kits” on page 30.

BCM physical dimensions

Table 1"BCM450 physical dimensions" (page 13) describes the physical dimensions of the BCM main unit and expansion cabinet.

Table 1 BCM450 physical dimensions

Dimensions	BCM main unit	BCM expansion cabinet
Height	7 in. (17.8 cm)	7 in. (17.8 cm)
Width	17.5 in. (44.5 cm)	17.5 in. (44.5 cm)
Depth	18 in. (45.8 cm)	18 in. (45.8 cm)

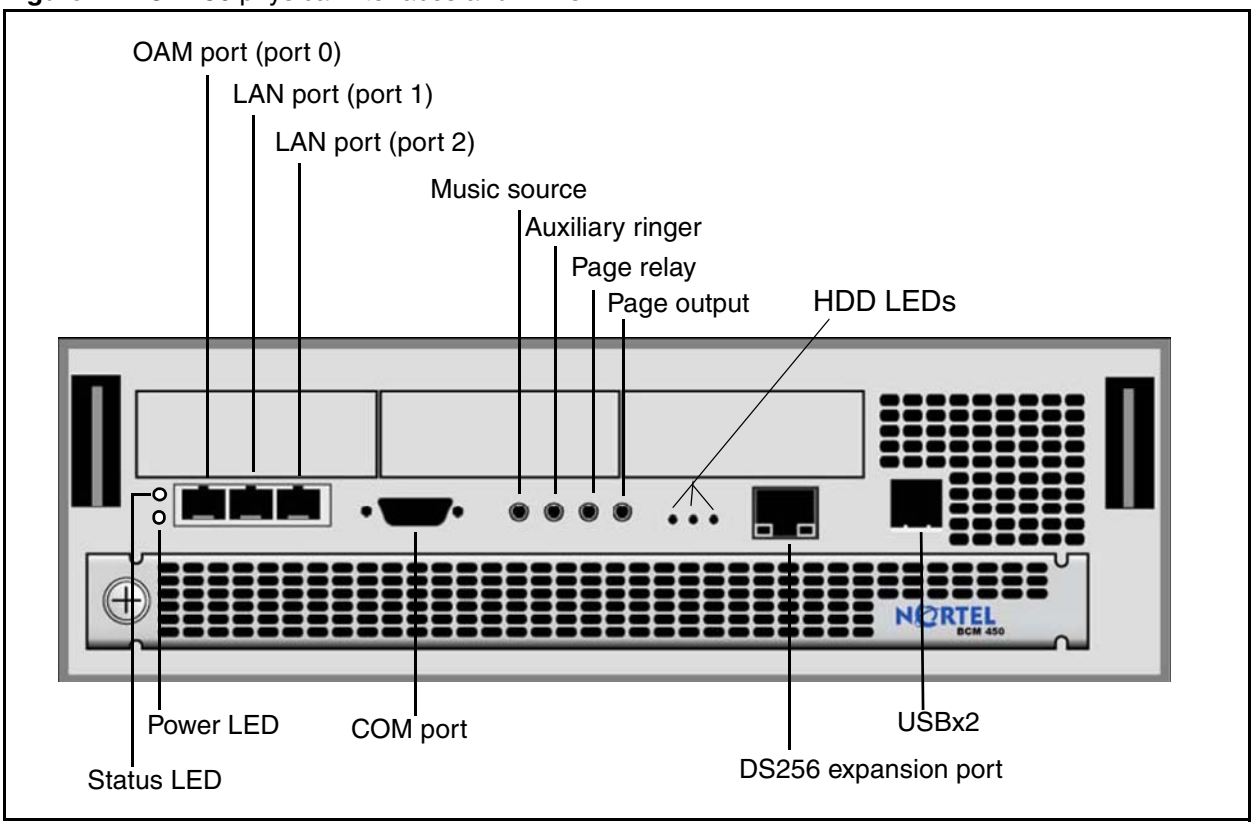
The BCM main unit and expansion cabinet design features include in following components:

- rubber feet that allow unit installation on a desktop or a shelf
- optional wall-mount bracket kit
- optional rack-mount shelf

BCM physical interfaces

Figure 2"BCM450 physical interfaces and LEDs" (page 14) maps the physical interfaces of the BCM450 hardware.

Figure 2 BCM450 physical interfaces and LEDs



Your BCM is equipped with the following interfaces:

- An RJ-45 jack used to connect a computer running administration software, such as Element Manager, to the main unit.
- Two RJ-45 jacks used to connect the customer LAN to the main unit.
- Two USB 2.0 (compatible with USB 1.1) ports used to connect USB storage devices or the data interfaces for an uninterruptible power supply (UPS) to the main unit.
- One DS256 jack to connect the BCM expansion cabinet to the BCM450 main unit.
- One auxiliary ringer jack to control the cadence of an auxiliary ringer (customer supplied).
- A page relay jack connects a floating relay contact pair. The BCM450 system uses this jack to control the external paging amplifier.

- A page output port allows generated voice paging signal to an external paging amplifier (customer supplied).
- Music on hold input supported either through the front panel jack.

You can extend the capacity of your system by using the optional "BCM expansion cabinet or unit and media bay modules" on page 29.

Chapter 3
BCM50 hardware

The information in this chapter applies to both the BCM50 platforms running BCM 5.0.

BCM50 is available in six configurations.

- BCM50: The compact main unit, suitable for networks where you do not require integrated data-routing capability or if your networks already have an IP network.
- BCM50a: Includes an ADSL router.
- BCM50e: Includes an integrated Ethernet router.
- BCM50b: Includes an integrated Dual ISDN S/T BRI.
- BCM50be: Includes an Ethernet router and a Dual ISDN S/T BRI.
- BCM50ba: Includes ADSL router and a Dual ISDN S/T BRI.

Figure 3"BCM50e" (page 17) shows the BCM50e.

Figure 3 BCM50e

For more information, see “"BCM50e and BCM50a: BCM systems with integrated routers" (page 20) or "BCM50b, BCM50ba, and BCM50be: BCM systems with integrated BRIs" (page 23).

BCM50a and BCM50ba models are not sold with Release 5.0 installed at factory. However, BCM50a and BCM50ba systems support release 5.0 software when upgraded to that software level.

For more information about BCM50 hardware, see Nortel Business Communications Manager 50 Installation and Maintenance Guide (NN40170-305).

BCM50 main unit

The BCM50 Main Unit (with telephony only) provides call processing and simple data-networking functions. It provides connections for 12 digital telephones, 4 PSTN lines, 4 analog station ports, and 4 connections for auxiliary equipment (auxiliary ringer, page relay, page output, and music source). The BCM50 Main Unit has no router, but it has four LAN ports: one is the OAM port for technicians, and three are for basic LAN connectivity.

A Main Unit contains the following field-replaceable units:

- one programmed hard disk
- one cooling fan
- one router card (BCM50a, BCM50e, BCM50ba and BCM50be only)

Additional BCM50 hardware

The BCM50 expansion unit is a compact unit that accommodates the Media Bay Modules (MBM) used by other BCM platforms. The BCM50 main unit can support a maximum of two expansion units. For more information, see "BCM expansion cabinet or unit and media bay modules" (page 29).

The wall-mount bracket is an inexpensive bracket for mounting the BCM50 or expansion unit to a wall; for more information, see "Mounting kits" (page 30). An optional wiring card, which provides RJ-45 connectors for all main unit trunk and station interfaces, is also available for use with the wall-mount bracket.

The rack-mount shelf is an inexpensive shelf for mounting a maximum of four BCM50 systems into a standard 19-inch rack. For more information, see "Mounting kits" (page 30). An optional patch field that provides RJ-45 connectors for all main unit trunk and station interfaces is also available.

BCM50 supports the complete range of IP telephony capability offered by existing BCM products. These features are enabled through keycodes and require no additional hardware:

- VoIP Gateway (H.323 or SIP): up to 12 VoIP trunks
- VoIP Telephony Clients: up to 32 VoIP Telephony clients, that support the IP Softphone 2050 client, the Mobile Voice Client 2050 and the complete range of Nortel IP phones
- Gateway trunks: up to 12 SIP trunks

BCM50 physical dimensions

BCM50 has a compact plastic enclosure so that you need not add hardware to enable features and applications. The compact size and flexible installation options support fast installations and accommodate the diverse environmental and physical conditions of small businesses.

Table 2"BCM50 physical dimensions" (page 19) describes the physical dimensions of the BCM50 main unit and expansion unit.

Table 2 BCM50 physical dimensions

Dimensions	BCM50 main unit	BCM50 expansion unit
Height	2 in. (5.1 cm)	2 in. (5.1 cm)
Width	8.5 in. (21.6 cm)	8.5 in. (21.6 cm)
Depth	12.5 in. (31.8 cm)	12.5 in. (31.8 cm)

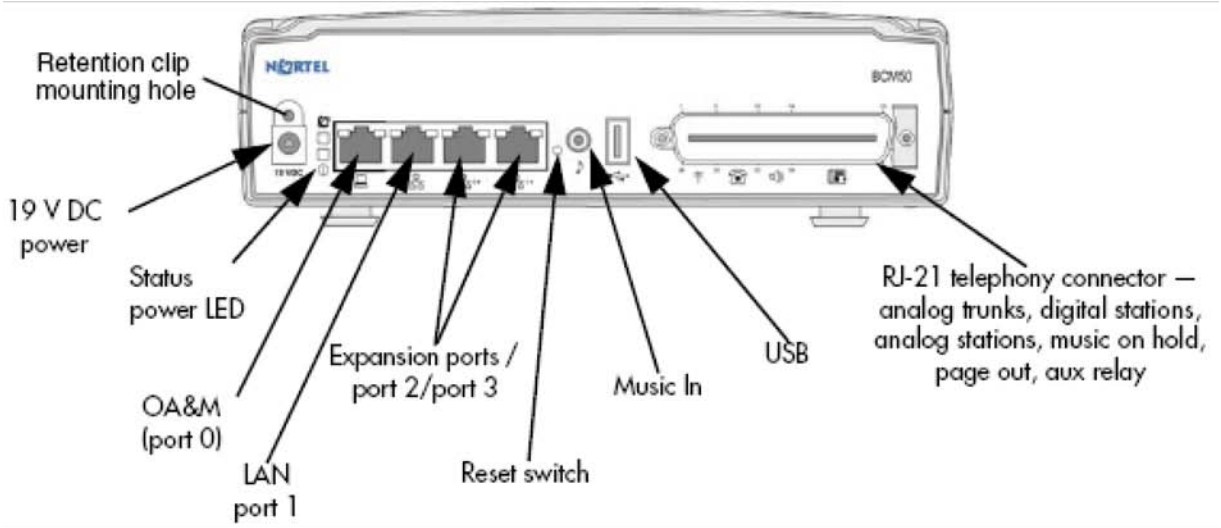
The BCM50 main unit and expansion unit design features include in following components:

- external power supply
- stackable units
- rubber feet that allow unit installation on a desktop or a shelf
- optional wall-mount bracket
- optional rack-mount shelf

BCM50 physical interfaces

The BCM50 interfaces preclude the need for additional hardware. See Figure 4"BCM50 Front panel and interfaces" (page 19) for a graphical representation of the BCM50 interfaces.

Figure 4 BCM50 Front panel and interfaces


Retention clip mounting hole
19 V DC power
Status power LED
OA&M (port 0)
LAN port 1
Expansion ports / port 2/port 3
Reset switch
Music In
USB
RJ-21 telephony connector — analog trunks, digital stations, analog stations, music on hold, page out, aux relay

Your BCM50 is equipped with these interfaces:

- Twelve digital station ports support the complete line of Business Series Telephones. These ports are accessible through the front panel RJ-21 connector and are enabled through keycodes.

- Four Analog Loop Supervised Trunks. These ports are accessible through the front panel RJ-21 connector and are enabled through keycodes.
- Four Analog Station interfaces with message waiting and CLID support. These ports are accessible through the front panel RJ-21 connector and are enabled through keycodes.
- Page and auxiliary relay output on the front panel RJ-21 connector.
- Three-port 10/100 Ethernet switch with automatic sensing and automatic polarity. Two of these ports support connecting optional expansion units.
- One 10/100 Ethernet port reserved for direct-access management of the system.
- Music on hold input supported either through the front panel jack or an RJ-21 connector.
- USB port to enhance BCM50 management.

You can extend the capacity of your system by using the optional BCM expansion cabinet or unit and media bay modules (page 29).

BCM50e and BCM50a: BCM systems with integrated routers

BCM50 is available with an optional integrated ADSL or Ethernet router. These units suit the needs of small businesses and small enterprise branch offices that require external data networking, such as Internet access or VPN-based networking to other offices.

Two variations of the BCM50 have an integrated router, depending on the WAN interface you require: the BCM50e (Ethernet WAN) and, BCM50a (ADSL WAN). Both routers have the following data features:

- secure Internet access
- multisite VoIP trunking using secure VPN tunnels
- wide-area VoIP applications with remote user support
- remote IP management and support using VPN clients

Common features and capabilities

BCM50a and BCM50e share the same functionality, which focuses on secure Internet access and VoIP.

BCM50e and BCM50a have three additional Ethernet LAN ports for a total of six LAN ports for local premises use. All Ethernet ports are 10/100 Mb/s automatic sensing and support automatic polarity. Therefore, you require no crossover cable to connect data hardware to the unit. An additional port is provided for WAN access for, either Ethernet or ADSL.

The following features make BCM50a and BCM50e attractive for small sites that want to become Internet-capable and multisite enterprises with many small sites. Until now, these sites could not be part of the corporate WAN because of the high cost of traditional WAN connectivity and managed service.

VPN

- 10 IPSec Branch Office Tunnels (peer-to-peer)
- IPSEC client termination supported

- support for bandwidth management
- support for Dynamically addressed peers – ABOT
- support for Client Tunnel origination (not termination) to simplify the connection to a larger VPN Router network
- IKEv1 Main Mode
- IKEv1 Quick Mode
- Diffie-Hellman Group 1,2
- IPSec Tunnel Mode
- ESP
- NAT Traversal

Security Services

- cryptographic services
- DES and 3DES
- data authentication SHA-1
- data authentication MD-5
- authentication services
- preshared secrets
- security services
- stateful firewall
- intrusion detection
- AES support
- digital certificates supported
- RADIUS support

NAT

- many-to-one, static, many-to-many
- port forwarding
- IPSec pass through
- NAT support for tunnel mode IPSec tunnels
- Throughput traffic performance - 23.1 Mb/s

Router

- Clear text routing
- Static: through tunnel
- RIP v1: through tunnel and clear text
- RIP v2: through tunnel and clear text

IP Services

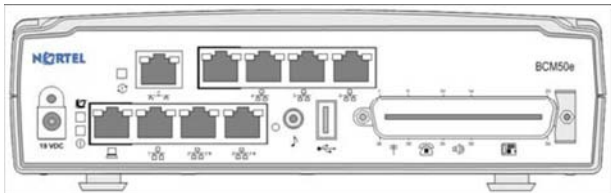
- DHCP client
- DHCP server with support for Nortel Internet Telephones
- DHCP Relay supported

- DNS Proxy
- DNS with VPN client
- WAN failover supported
- PPPoE
- PPTP (ethernet router only)
- Configurable MAC address
- Clear text traffic:
  - WAN to LAN 33.9 Mb/s
  - LAN to WAN 30.5 Mb/s

BCM50e

The BCM50e in Figure 5"BCM50e front panel" (page 22) provides call-processing and data-routing features and is suitable for networks that require data-routing capability using an integrated Ethernet router. The WAN interface port provides 10/100 Ethernet with automatic sensing and automatic polarity. If you have existing or alternative WAN access technology, you can still benefit from the VoIP features of the BCM50.

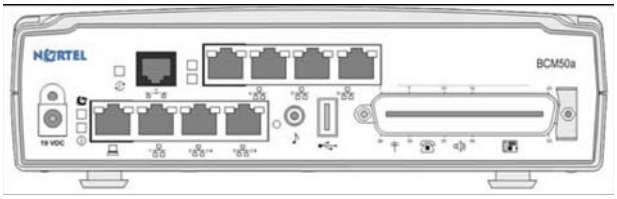
Figure 5 BCM50e front panel



BCM50a

The BCM50a in Figure 6"BCM50a front panel" (page 22) provides call-processing, data-routing features, and an integrated ADSL modem. The BCM50a is a stand-alone set of integrated applications. With the BCM50a, you have complete voice and Internet service with efficiency and convenience.

Figure 6 BCM50a front panel



These features provide a complete, integrated Communications Server/ADSL access package for ease of interconnecting with service-provider ADSL networks:

- ITU G.992.1 (G.DMT)
- G.992.1 Annex A

- ITU G.992.2 (G.Lite)
- ANSI T1.413 Issue 2
- DSL Forum document TR-042 ATM Transport over ADSL
- G.hs 994.1
- G.ploam G.997.1
- Autonegotiation rate adaptation
- RFC 2364 PPP over AAL5
- RFC 2684 Multi protocol Encapsulation over ATM, both Bridged and Routed encapsulation
- Support for British Telecom SIN 329
- Broadband IP Products requirements for End User NTE equipment, where the router and ADSL modem functions are integrated into one device
- RFC 1483 Multi-protocol over AAL5
- RFC 2365 PPP over AAL5
- RFC 2516 PPPoE
- Traffic-shaping UBR, CBR
- ATM forum UNI 3.1/4.0 PVC (minimum 5 PVCs)

BCM50b, BCM50ba, and BCM50be: BCM systems with integrated BRIs

The BCM50 system provides private network and telephony-management capability to small and medium businesses the EMEA and APAC markets. The BCM50 integrates voice and data capabilities, IP telephony gateway functions, and data-routing features into a single telephony system. The BCM50 is a compact system that you use to create and provide telephony applications for use in a business environment.

Common features and capabilities

- BRI Compact Daughter Card (CDC)— Performance conforms to ITU I.430, ETSI ETS 300012, ANSI T1.605, and safety standards and lightening protection
- Additional CDC connector, for a total of two CDC slots
- Xilinx FPGA - XC3S400-4FT256C
- Integrated eight-port 10/100 Ethernet switch to support future eDSP CDC (upgraded from five-port)
- 2.5 in. hard drive and new bracket
- Optimized position of fan cable, SATA cable, and hard-drive connector
- POL Current Limiting
- Introduce BRI and improve pack performance, and customer feature set.
- Memory parity
- Upgrade DSP and microprocessor

- GASI support

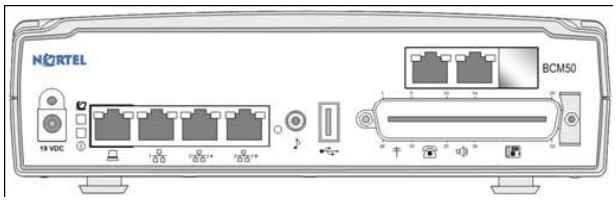
BCM50b

The BCM50b Main Unit provides functionality similar to the BCM50 main unit. The difference is that the BCM50b main unit has two integrated BRI ports that replace the four analog lines on the RJ-21 telephony connector.

- new CSC with integrated BRI in place of integrated GATI
- keycode BRI ports

Figure 7"BCM50b front panel" (page 24) shows a BCM50b front panel.

Figure 7 BCM50b front panel

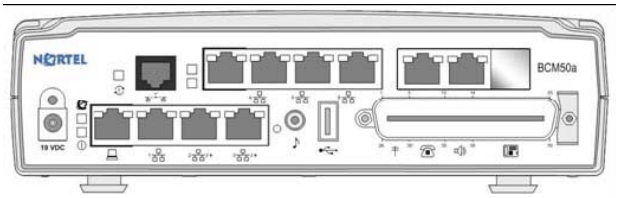


BCM50ba

The BCM50ba Main Unit provides similar functionality to the BCM50a main unit. The difference is that the BCM50ba main unit has two integrated BRI ports that replace the four analog lines on the RJ-21 telephony connector.

Figure 8"BCM50ba front panel" (page 24) shows a BCM50ba front panel.

Figure 8 BCM50ba front panel

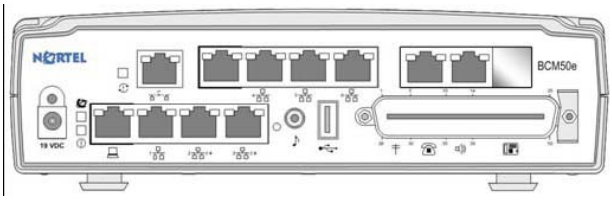


BCM50be

The BCM50be Main Unit provides similar functionality to the BCM50e main unit. The difference is that the BCM50be main unit has two integrated BRI ports that replace the four analog lines on the RJ-21 telephony connector.

Figure 9"BCM50be front panel" (page 25) shows a BCM50be front panel.

Figure 9 BCM50be front panel



Chapter 4
LED strategy

The information in this chapter applies to both the BCM50 and the BCM450 platforms running BCM 5.0.

BCM offers a simplified LED strategy, reducing the status LEDs to two: the Power LED and the Status LED (see Figure 2"BCM450 physical interfaces and LEDs" (page 14) and Figure 4"BCM50 Front panel and interfaces" (page 19)). The Power and Status LEDs provide visual status for the platform areas shown in Table 3"LED states with descriptions of LED combinations" (page 27).

Table 3 LED states with descriptions of LED combinations

Power LED	Status LED	LED combinations description
Start-up sequence		
Solid yellow	Solid yellow	Power is applied to the system.
Solid yellow	Off	POST (Power On Self Test) (duration 9 seconds)
Solid yellow	Solid yellow	System initialization (duration 14 seconds)
Solid green	Solid yellow	Kernel initialization (duration 8 seconds) or Safe OS
Solid green	Blinking green	Services initialization (duration 1 minute)
Solid green	Solid green	System running
Solid green	Solid red	Services initialization FAILURE
Safe Mode start-up sequence		
Solid red	Solid green	System is running with manufacturing settings enabled
Solid red	Solid red	System is running in Software Reset mode
Solid red	Blinking yellow	System is running in Configuration Reset mode
Shutdown sequence or FAILURE		
Solid green	Blinking yellow	Graceful shutdown in progress (trigger: Element Manager or UPS)
Off	Solid yellow	Graceful shutdown completed.
Solid red	Blinking yellow	Overheat detected; thermal shutdown completed
Solid red	Solid red	Power spike or rail power fluctuation detected
Blinking red	Solid red	Rail power fluctuation; power monitor shutdown completed
Solid yellow	Solid red	Power spike shutdown completed (temperature and rail power OK)
Off	Off	No power; system is shut down (power cable is disconnected)
Start-up profile (LED combinations seen only during initial system install or staging)		

Table 3 LED states with descriptions of LED combinations

Power LED	Status LED	LED combinations description
Blinking yellow	Blinking yellow	Start-up profile executing
Solid green	Solid green	Start-up profile successfully applied
Blinking yellow	Blinking red	Start-up profile FAILURE

Chapter 5
BCM expansion cabinet or unit and media bay modules

The information in this chapter applies to both the BCM50 and the BCM450 platforms running BCM 5.0.

BCM450 capacity can be expanded by means of an expansion cabinet. BCM50 capacity can be expanded by means of an expansion unit. Expansion cabinets and expansion units are populated with media bay modules (MBM).

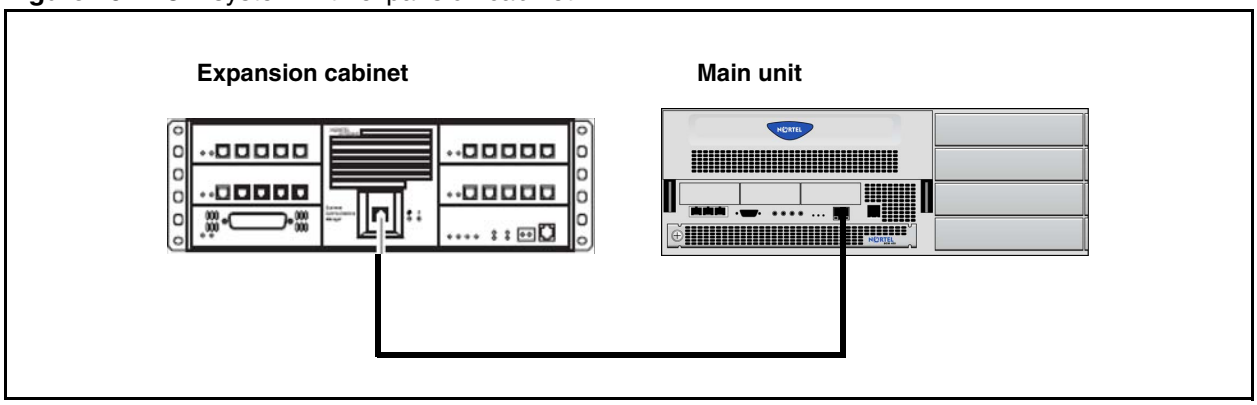
BCM450 expansion cabinet

You can expand BCM trunk and station capacity by connecting an external BCM expansion cabinet. The expansion port on the BCM is enabled through keycodes.

The expansion cabinet is easy to integrate and install with the BCM using the wall-mount and rack-mount accessories. The expansion cabinet connects to the BCM using an RJ-45 CAT5 cable and uses its own external power supply, both of which are provided with the expansion cabinet.

An expansion cabinet can support six MBMs. Figure 10"BCM system with expansion cabinet" (page 29) shows a BCM450 system with expansion cabinet.

Figure 10 BCM system with expansion cabinet



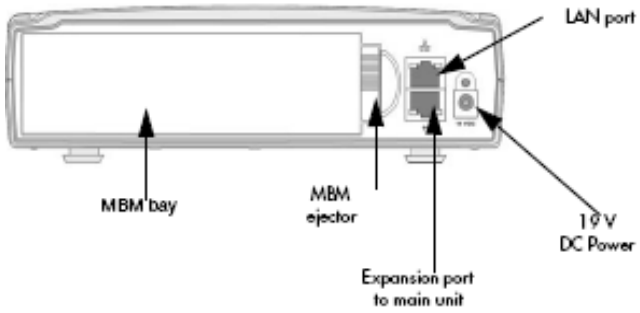
BCM50 expansion unit

You can expand BCM50 trunk and station capacity by connecting up to two external BCM50 expansion units. Expansion ports on the BCM50 are enabled through keycodes.

The expansion unit fits easily with the BCM50 and is easy to integrate and install using the wall-mount and rack-mount accessories. The expansion unit connects to the BCM50 using an RJ-45 CAT5 cable and uses its own external power supply, both of which are provided with the expansion unit.

Figure 11"BCM50 Expansion unit" (page 30) shows an expansion unit.

Figure 11 BCM50 Expansion unit



BCM media bay modules

BCM supports the following MBMs:

- 4x16 Combo (4 analog trunks, 16 digital stations) — North America only
- 8x16 combo (8 analog trunks, 16 digital stations)
- ADID4 and ADID8 modules — North America only
- ASM8+ (8-port analog station interface) — North America only
- CTM4 (4-port CLID trunk module) — North America only
- CTM8 (8-port CLID trunk module) — North America only
- DTM (digital trunk module)
- BRI (ISDN Basic Rate trunk module)
- DSM16+ (16-port digital station module)
- DSM32+ (32-port digital station module)
- GATM4 (4-port global analog trunk module)
- GATM8 (8-port global analog trunk module)
- GASM8 (8-port global analog station module)
- R2MFC
- FEM, for BCM450

Mounting kits

Businesses can have a range of physical environments in which the system must be installed. Mounting kits are available for the BCM450 and BCM50.

BCM450

The BCM has optional accessories you can use to tailor the installation to the needs of the location. For more information on mounting options, mounting equipment, and procedures, refer to *Nortel Business Communications Manager 450 5.0 Installation—System* (NN40170-303).

BCM50

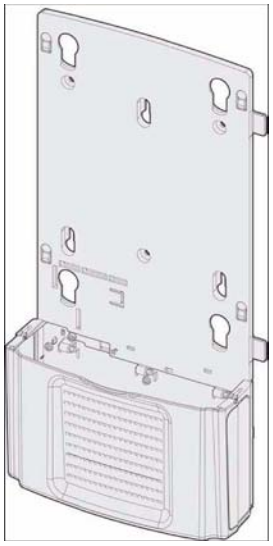
The BCM50 has optional accessories you can use to tailor the installation to the needs of the location.

Small system wallmount bracket

You can use this optional bracket to mount the BCM50 and expansion unit on a vertical surface. Attach the bracket to the surface and hang the BCM50 from the bracket. The details on the bracket ensure that the BCM50 securely locks into place. The bottom of the bracket includes a covered cable tray to organize cables. An optional add-in card that mounts into the cable tray is available, to provide RJ-45 connections for the main unit trunk and station interfaces.

Figure 12"Small system wallmount bracket" (page 31) shows a small system wallmount bracket.

Figure 12 Small system wallmount bracket

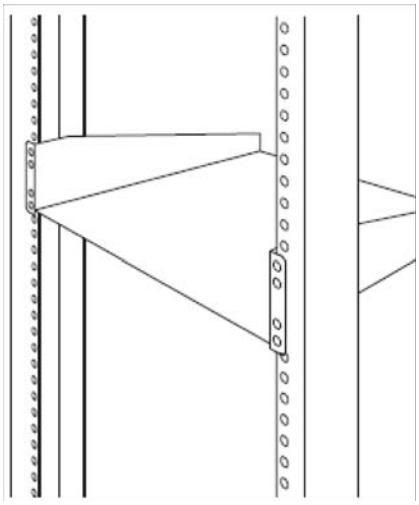


Small system rackmount bracket

You can install this optional shelf in a standard 19-inch rack and mount the BCM50 and expansion unit on it. The details on the shelf firmly lock the BCM50 in place. The bracket also provides space to store power supplies for the BCM50. An optional patch panel is available to provide RJ-45 connections for the main unit trunk and station interfaces.

Figure 13"Small system rackmount shelf" (page 32) shows a small system rackmount shelf.

Figure 13 Small system rackmount shelf



Chapter 6
BCM features

The information in this chapter applies to both the BCM50 and the BCM450 platforms running BCM 5.0.

This chapter contains the following sections:

- "Telephony features" on page 33
- "New features" on page 34
- "Existing features" on page 36

Telephony features

BCM provides a full set of telephony features that can respond to the various requirements of your business. BCM supports the following features and components:

- full set of base telephony features consistent with the BCM portfolio
- Business Series Telephones including Doorphone
- analog station terminals, including phones and fax machines
- IP phones, such as IP 2000 series, IP 1100 series, IP 1200 series phones, and WLAN IP handsets

IP telephony features

Table 1"IP telephony features" (page 34) lists IP telephony features currently provided in the BCM product line.

Table 1 IP telephony features

IP Telephony feature	Supported on BCM450	Supported on BCM50
G.711 and G.729 codecs with echo cancellation	yes	yes
H.323 VoIP trunking	yes	no
SIP VoIP trunking	yes	no
MCDN support on both H.323 and SIP trunks	yes	no
H.323 IP trunking and MCDN over H.323	no	yes
SIP and SIP proxy	no	yes
MCDN SIP trunking	no	yes
T.38 Fax over IP	yes	yes
G.711 Fax over IP	yes	no

Note: Support for desktop clients includes Nortel IP telephone portfolio including IP Phone 1210, IP Phone 1220, IP Phone 1230, IP Phone 2001, IP Phone 2002, IP Phone 2004, IP Phone 2007, IP Phone 1110, IP Phone 1120e, IP Phone 1140e, IP Audio Conference Phone 2033. Support for soft-clients is offered through the IP 2050 software phones that extend voice services to mobile and home-based employees over the Internet.

New features

The following list indicates the new features introduced with Nortel Business Communications Manager 5.0 (BCM 5.0).

- “Find Me/Follow Me” on page 34
- “Professional Call Recording” on page 35
- "InTouch" (page 35)
- "Message Forwarding" (page 35)
- "SIP Trunk User Accounts" (page 35)

Find Me/Follow Me

Find Me/Follow Me allows simultaneous ringing of up to five different external destinations. Users and administrators can configure these destination numbers. Using Find Me/Follow Me, you can pick up a call either at your primary extension (your desk phone for example) or at one of the five external destinations, such as a cell phone, your home phone, or another phone. When you answer the call at one destination the other alerting calls are disconnected. By doing this, the Find Me/

Follow Me feature reduces the chance of missed calls. You can then transfer the answered call back and forth between your desk phone and other devices on your Find Me/Follow Me external destinations list. For more information about Find Me/Follow Me, see *Nortel Business Communications Manager Find Me/Follow Me Administration Guide* (NN40010-678) and *Nortel Business Communications Manager User Guide* (NN40010-118).

Professional Call Recording

The professional call recording feature records a call from the time that you request to record the call until the call ends. The feature supports recording a conference call hosted or joined by a DN. For more information about Professional Call Recording, see *Nortel Business Communications Manager 5.0 Configuration—Telephony* (NN40170-502), and *Nortel Business Communications Manager 5.0 Planning and Engineering* (NN40170-200).

InTouch

InTouch is a new feature that integrates with a user's Microsoft Outlook, and provides direct one-touch interaction between a user's telephony, email, calendar and instant messenger. InTouch brings together all popular forms of communications from within both Outlook and external contacts. InTouch appears as a contact list that is part of your Outlook screen. This is referred to as the "UC Activity Pane". Regardless of which Outlook page the user may have on their screen at any time (Mail, Calendar, Outlook Contacts or Tasks), the InTouch task panel will retain the same view and functionality.

For more information about InTouch, see *InTouch User Guide* and *InTouch Administration Guid*e.

Message Forwarding

With the Message Forwarding feature, mailbox owners can send an e-mail message when new or urgent voice messages arrive in their CallPilot mailbox. Message Forwarding can attach the voice or fax message to the forwarded e-mail message so users can play the voice message or view the fax on the destination device. For more information about Message Forwarding, see *Callpilot Manager Setup and Operation Guide* (NN40170-300).

SIP Trunk User Accounts

A new section on the SIP Authentication screen provides for provisioning of the individual SIP user accounts. For more information about configuring SIP User Accounts, see *Nortel Business Communications Manager 5.0 Configuration—Telephony* (NN40170-502).

Existing features

In addition to features introduced in previous BCM releases, BCM Release 5.0 includes features that are present in previous BCM platforms such as BCM50 3.0 and BCM 4.0. These include the feature listed in the table below.

Table 4 Existing BCM features

Existing feature	Supported on BCM450	Supported on BCM50
"Capacity" (page 37)	yes	yes
"Dynamic Device Configuration" (page 38)	yes	yes
"WLAN 6120 and 6140 handsets" (page 38)	yes	yes
"System reset button" (page 39)	yes	yes
"Power On Self Test logging" (page 39)	yes	yes
"Security" (page 39)	yes	yes
"Meet Me Conferencing" (page 41)	yes	yes
"Software upgrade" (page 41)	no	yes
"SIP trunk enhancements" (page 42)	no	yes
"Silent Record-a-call" (page 44)	no	yes
"Activity Reporter" (page 44)	no	yes
"R2MFC MBM support" (page 44)	yes	yes
"EU-compliant routers M222 and M252 firmware" (page 44)	no	yes
"WAN failover" (page 45)	no	yes
"Integrated Services Digital Network Basic Rate Interface dial-up support" (page 45)	no	yes
"Network Configuration Manager support for BCM" (page 45)	yes	yes
"Global Analog Trunk Interface localization" (page 45)	no	yes
"Analog Direct Inward Dial Media Bay Module" (page 45)	yes	yes
"8x16 Media Bay Module" (page 45)	yes	yes
"Next generation IP phones" (page 46)	yes	yes
"SIP and H.323 interoperability" (page 46)	yes	yes
"Hardware inventory" (page 47)	yes	yes
"Proactive voice quality monitoring" (page 47)	yes	yes
"Ad Hoc conferencing" (page 47)	yes	yes
"Meridian Customer Defined Network Trunk Anti-Tromboning with integrated applications" (page 48)	no	yes
"Session initiated protocol" (page 48)	yes	yes
"Terminal and mobility support" (page 49)	yes	yes
"Global markets" (page 49)	yes	yes

Table 4 Existing BCM features

Existing feature	Supported on BCM450	Supported on BCM50
"Set templates" (page 52)	yes	yes
"Parameter renumbering" (page 52)	yes	yes

For new features and capabilities introduced with BCM 5.0, see “New features” on page 34.

Capacity

For BCM450, the base platform supports 100 stations, 48 trunk channels (with the exception of E1 trunks, which support two DTM MBMs for a total of 60 E1 trunks), 64 conference participants, and 2 fax ports.

BCM features are enabled through keycodes and require a CEC to be installed to allow maximum capacities:

- VoIP Gateway (H.323 or SIP): up to 130 VoIP trunks for BCM450 and up to 12 VoIP trunks for BCM50
- VoIP Telephony Clients: up to 300 VoIP Telephony clients for BCM450, that support the IP Softphone 2050 client, the Mobile Voice Client 2050 and the complete range of Nortel IP phones, and up to 32 VoIP Telephony clients for BCM50
- SIP Gateway trunks: up to 130 SIP trunks for BCM450, and up to 12 SIP trunks for BCM50

Table 5" BCM capacity" (page 37) provides the overall capacity limits of the BCM450 and BCM50 platforms. Table 6" Device type maximums" (page 37) shows the device type maximums for the BCM450 and BCM50.

Table 5 BCM capacity

Feature	Value for BCM450	Value for BCM50
Digital sets support	300 total users of any mix of analog, IP, and digital sets (with CEC installed)	76 (44 with one DSM)
IP sets support	Up to 300, depending on other set allocation (with CEC installed)	32
Conference participants	120 (Ad hoc or Meet Me participants)	18 (Ad hoc or Meet Me participants)
Unified Messaging seats	300	50
Voice mail storage	400 hours (with CEC installed)	120 hours
Fax	up to 8 ports	up to 2 ports

Table 6 Device type maximums

Device type	Value for BCM450	Value for BCM50
Maximum TDM set DNs	300	44
Maximum number of IP set DNs	300	32

Table 6 Device type maximums

Device type	Value for BCM450	Value for BCM50
Maximum number of application DNs	300	64
Maximum number of target lines (target line numbering starts at line 361)	639	176
Maximum number of TDM trunks (analog and digital physical trunks)	130	2
Maximum number of IP trunks	130	12
Maximum conference parties	120	18
Maximum Find Me/Follow Me users	300	50
Maximum Professional Call Recording ports	16	40 (80 with CEC installed)
Maximum In Touch users	256	256

Dynamic Device Configuration

BCM450 5.0 supports a different method a assigning directory numbers (DN) and line numbers to devices and hardware on the platform.

On previous platforms all possible DNs and line numbers were preconfigured, regardless of the actual configured hardware on a system. For BCM450 5.0, DN and line number allocation and assignment must be provisioned

When a hardware device is installed on the BCM, you must configure that device to assign the necessary DNs and lines and other associated resources to make that device operational. To remove a device, you must deconfigure it first.

Dynamic Device Configuration is not supported on BCM50 5.0, however, the Telephony Resources screen in Business Element Manager now has a similar look and feel to the BCM450 version.

WLAN 6120 and 6140 handsets

BCM 5.0 supports the new WLAN 6120 and 6140 phone models. For more information on these new handsets, refer to *WLAN 2210/2211/2212 Handset Installation and Configuration Guide Addendum* (NN40050-400) and *WLAN 2210/2211/2212 Handset User Guide Addendum* (NN40050-401).

System reset button

The BCM450 and BCM50 5.0 system is equipped with a reset button which reboots and makes available a user interface to invoke a configuration reset (Level 1) or software reset (Level 2).

After pressing the reset button, connect a PC to the local OAM BCM port (Ethernet or serial), and log on to the system (while it is running the Safe OS mode).

Enter the command for level 1 or level 2 reset. Alternately, you can decide not to do a Level 1 or Level 2 reset and simply reboot the system in normal mode.

For more information on system resets, refer to *Nortel Business Communications Manager 5.0 Administration and Security* (NN40170-603).

Power On Self Test logging

Power On Self Test (POST) is a set of hardware tests occurs early in the system boot cycle. The data from these tests are captured and published to the standard log system when the boot cycle is complete.

When the BCM is powered up, it goes through a number of POST to validate the system. Results from the POST are currently displayed on the serial port in real time.

The solution provided here is a complete solution for making POST results available on the main file system.

Security

BCM supports the following security enhancements introduced in previous BCM platforms.

Last failed login time

The last failed login time information is added to the current user panel in Element Manager and displays the last time the login was attempted and failed.

Web access on Secure Socket Layer Version 3

BCM sets the default Secure Socket Layer (SSL) protocol to SSLv3 for Web access.

User account access management

This feature significantly improves BCM user-account access management by enhancing password, session, account authentication, and access-management. These improvements align the BCM with the security enhancements introduced with BCM50 and add incremental capabilities.

Password Management and Policy Enhancements include

- Minimize the vulnerability of passwords
  - password characteristics are now more stringent (length, criteria)

- password aging, history and change notification added
- forced password change on initial login
- password storage hashing with Secure Hashing Algorithm 1 (SHA1)

Session Management Enhancements minimizes the vulnerability of logged-on sessions for idle session time outs.

Account Management includes

- Minimize the vulnerability of User IDs
  - Automatic disabling of unused accounts
  - Set-based administration requires user ID and password

Account User ID Access Privilege Management includes the logged-on user ID session and access display.

These enhancements to user-account access management provide a secure BCM access environment, which makes it difficult for a malicious user to gain access to a BCM. BCM owners can enforce secure account-access controls to the BCM to ensure secure BCM management and to increase protection against potential vulnerabilities.

Secure interface and audit logging

This feature enhances interface security by adding secure access controls, security audit logs (configchange.systemlog), and system activity by User ID, date, and time. Secure Interface Access and Communications Controls provide

- support for Secure Copy (SFTP) SSH encrypted file transfers
- support for Simple Network Management Protocol (SNMP) v2 and v3, including encryption provided with v3
- BCM owner control of Nortel technical support access
- use of digital signatures and enhanced tamper detection to ensure trusted sources for software upgrades (patches and software release upgrades)
- ability to test the system ability to generate alarms and logs, including system security alarms and logs

Audit log tracks critical changes to the system and the logon attempts, including

- last successful login identification and interface
- last failed login attempt and total failed logons since last successful logon
- configuration change log to track configuration changes to system by user ID

With audit logging of long attempts, the BCM user can track security violation attempts and determine further action. If you suspect a user ID security breach as a result of system configuration changes, the audit logging of configuration changes provides traceability to user IDs and interfaces.

An overall increase in security you have with effective logging capabilities for Audit Trail logs, Alarm logs and Configuration Change logs.

If you require improved interface access and communications security for alarm, log, and file transfers, you can use these security enhancements. As well, you can audit and identify the critical system changes that specific users initiate.

Platform accounts

Platform accounts are integrated accounts that allow access to Element Manager and other functions based on privileges. The maximum number of accounts is increased to 280 active accounts for each BCM.

User ID length

The maximum character length for the user ID is 128 characters.

Meet Me Conferencing

Meet Me Conferencing is supported on all BCM 5.0 systems. With Meet Me Conferencing, callers can establish a teleconference by calling in to a specified number at an agreed-upon time. One caller acts as the chairperson and has additional powers to start, stop, secure, and control the conference.

Anyone can participate in a conference, but a BCM user must have chairperson privileges to chair a conference.

Meet Me Conferencing has a special directory number (DN) used to access the Meet Me Conferencing feature. Although you can access a conference in several ways, the system administrator should notify every conferencing user of the Meet Me Conferencing DN.

Software upgrade

The upgrade impacts all on-box software of a field installed BCM50 2.0, BCM50 3.0, or BCM450 1.0 system to BCM 5.0 software while preserving customer programmed data. New software introduced as part of the BCM 5.0 program is installed as part of the upgrade. An upgraded BCM 5.0 system is functionally equivalent to a factory BCM 5.0 system. The target time for an upgrade is 45 minutes.

The upgrade with BCM 5.0 and Business Element Manager supports remote and scheduled upgrades. This new capacity is significant for partners and administrators to reduce installation costs and business impacts.

Support exists for the following upgrade paths:

- BCM50 2.0 to BCM50 5.0
- BCM50 3.0 to BCM50 5.0
- BCM450 1.0 to BCM450 1.0
- BCM50 systems running Release 1.0 software can be upgraded to Release 5.0 software, but must first be upgraded to Release 2.0 or 3.0 software, and then from Release 2.0 or 3.0 to Release 5.0.

BCM200/400 system upgrade

Field installed BCM200 and BCM400 systems can be upgraded to BCM 5.0 with the purchase of a hardware and software upgrade kit. The upgrade kit will include a new Chassis Interface Card (CIFC), Base Function Tray, and a hard disk drive pre-loaded with BCM 5.0 software.

Configuration settings and other data can be imported from the existing BCM200 or 400 to the newly upgraded system using the new Data Migration Manager (DMM) tool.

A BCM200 system or a BCM400 system upgraded to Release 5.0 has the same capacity and functionality as a BCM450 Release 5.0 system, however, an upgraded BCM200 system only has 2 MBM slots in the main chassis. Therefore, an upgraded BCM200 system can only support a maximum of 8 MBMs, compared to 10 for a BCM450 system.

Support exists for the following upgrade paths:

- BCM400 to BCM400 5.0
- BCM200 to BCM200 5.0

SIP trunk enhancements

SIP REFER

BCM50 5.0 supports SIP REFER, which is the call transfer mechanism for SIP. BCM responds to a REFER request on an existing call by making a second call and transferring the two calls together. BCM also responds to a REPLACE request on an incoming call by replacing the identified incoming SIP call with this new call.

SIP refer supports two types of call transfer:

- Blind (or Unattended): The TransferOR puts the primary call on hold, then dials the Transfer Target and completes the transfer without communicating with the Transfer Target. The TransferEE hears ringback on the secondary call and connects when the Transfer Target answers.
- Consult (or Attended): The TransferOR places the primary call on hold and establishes a Consult call (consultation) to another party. After the consultation, the TransferOR completes the transfer, causing the TransferEE to connect to the Transfer Target and replaces the Transfer Target's call with the TransferOR.

SIP Registration for SIP user accounts

An optional feature of each SIP trunk user account is ability to register with the remote domain on behalf of the SIP trunk user. You can enable SIP Registration through the SIP user account configuration screen.

SIP registration is widely used by SIP trunking service providers to simplify provisioning as an alternative to static mapping of DIDs to PBX address.

SIP proxy failover

A new setting, called Route all calls using proxy, on the SIP Proxy tab in the Business Element Manager, determines whether to ignore the Routing Table for SIP calls. With SIP proxy failover, the SIP Proxy configuration is used. The SIP Proxy Domain is mandatory and is used in SIP message headers.

A dedicated SIP Proxy Agent provides outbound proxy failover. The SIP Proxy Agent runs within the SIP Component of the FEPS process on the BCM.

RFC 2833

With RFC 2833 the BCM SIP gateway can send and receive Dual-Tone Multi Frequency (DTMF) digits on SIP trunks using RFC 2833. This feature does not apply to H.323.

For outgoing digits received, the core software enters the digits as DTMF. The Digital Signal Processor (DSP) intercepts the digits and encodes and them as described in RFC 2833. This is required in both short- and long-tone mode whenever the media path goes through the BCM. When the media path does not go through the BCM, the short tone digits are sent to Functional Endpoint Proxy Server (FEPS) in VDI messages.

For incoming digits, the core software handles incoming digit indications from FEPS and provides short-tone functionality. While the digits received can be longer than the short-tone duration, the long duration is not required.

SIP trunk authentication

SIP trunk local users are accounts used to authorize remote SIP entities when they attempt to connect through the SIP trunk interface to place calls through the BCM. SIP trunk accounts are also used for remote connections to the ISP and incoming call requests. The total number of SIP trunk accounts is 240.

Configuration of domain and ports for remote SIP trunk endpoints

Configuration and use of domain and port entries for remote endpoints allows more flexible installations, compared to the BCM 4.0 and BCM50 R2 use of IP addresses only. The BCM50 3.0 introduces RFC3263-based DNS support for locating SIP servers. The addition of DNS support means that customers do not need to know the IP addresses of those remote servers.Standards based DNS support using RFC3263 to simplify network deployment.

Optional G.711 based transport of FAX communication

This solution will allow the choice of whether T.38 or G.711 is used to transmit fax calls over SIP trunks, to and from the BCM. The choice is decided during configuration, and applies to all SIP trunk calls.

If T.38 is not configured, then SuperG3 fax and V.34 modem will be supported over G.711. Previously, they had to use G3/V.17 in case there was a switch to T.38 which cannot encode V.34 successfully.

Silent Record-a-call

Intelligent Contact Center Agent and Supervisor ad hoc silent record a call. This enables an agent or supervisor to silently record the call they are on. The recorded call is left in the agents/ supervisors mailbox or skillset mailbox.

This feature does not provide the ability for a supervisor to trigger silent call recording while listening in on an agent's call.

Activity Reporter

For information about the Activity Reporter and Activity Reporter Basic features, see the Activity Reporter Administration Guide and the Activity Reporter User Guide.

R2MFC MBM support

BCM supports the R2MFC MBM in selected Caribbean and Latin America (CALA) and APAC countries. See the matrices in “Global markets” on page 49.

EU-compliant routers M222 and M252 firmware

BCM50 routers deliver Removal of Hazardous Substances (RoHS) compliancy for network infrastructure, or 5/6 compliancy. This requires new hardware for both the Ethernet router and the ADSL router. The new hardware is based on a common architecture for both routers and is also common to Contivity EU releases.

These new features apply to the M222/252 routers only. A software upgrade is available for installed M221/251. The following features align to Contivity 2.5 with the addition of VPN client termination support.

- VPN Client Termination (new)
- Port Restricted Cone NAT
- SIP firewall ALG
- Nailed Up tunnels
- SSH, SSL and Secure FTP
- New hardware support for ADSL2+
- Client emulation enhancements
- Client management privileges
- Failover IP assignment for automatic assignment of fail over site IP address
- X.509 digital certificates
- New DSL version support for ADSL2+

Note that M221/251 refers to the routers shipped with BCM50 1.0 units, and M222/252 refers to the new EU-compliant routers shipped with EU BCM50 2.0 and BCM50 3.0 units.

WAN failover

The router hardware simplifies WAN failover as well as future management integration through the internal serial connector. The router provides support for WAN failover on all BCM50 platforms with M222/252 routers.

WAN failover allows calls that experience issues using the WAN link to continue over the soft modem or LAN or ISDN.

Integrated Services Digital Network Basic Rate Interface dial-up support

The BCM requires a data layer over the channelized Integrated Services Digital Network (ISDN) for remote management dial-up over Basic Rate Interface (BRI). Support is available for remote management over BRI over the integrated BRI CDC or BRI MBM configured for ISDN support. Support is available for all on-demand and scheduled management tasks, are such as CDR collection, backup and restore, software updates, and log collection.

Network Configuration Manager support for BCM

Network Configuration Manager (NCM) Release 5.0 supports BCM. The product is delivered to new customers on a new CD. For more information, see “Network Configuration Manager” on page 63.

Global Analog Trunk Interface localization

Global Analog Trunk Interface (GATI) supports EMEA, China, and APAC countries where the MBM is currently sold. See the country matrix in "Global markets" (page 49). Some profiles require new Disconnect Supervision (DS) or Caller ID (CLID) support as described in Table 7"Analog interface availability by market profile" (page 50) and Table 8"Digital interface availability by market profile" (page 51).

Analog Direct Inward Dial Media Bay Module

BCM adds Analog Direct Inward Dial (ADID) Media Bay Modules (MBM) (ADID4 and ADID8) for North America, Taiwan, and Hong Kong markets.

8x16 Media Bay Module

BCM has an 8x16 Combo MBM to deliver GATM8 plus DSM16 capability in one MBM. It requires only one expansion chassis and is available in all markets where the GATM8 or DSM16 is sold.

Next generation IP phones

BCM supports Next Generation IP phones from previous BCM platforms. PVQM, Desktop Assistant, and Business Element Manager button programming includes support for both existing sets and new sets. The following list provides the IP phone set types supported by BCM450:

- IP phone 7406e
- IP Phone 2001
- IP Phone 2002
- IP Phone 2004
- IP Phone 2007
- IP Softphone 2050
- IP Audio Conference Phone 2033
- IP Phone 1100
- IP Phone 1120e
- IP Phone 1140e
- IP Phone 1210
- IP Phone 1220
- IP Phone 1230

Note that IP Phone 7406e is pending.

SIP and H.323 interoperability

BCM matches BCM50 3.0 SIP and H.323 interoperability. For SIP support, see "Session initiated protocol" on page 48.

SIP interoperability includes the following products:

- BCM50 2.0 and BCM50 3.0
- BCM450 R1.0
- BCM200/400 4.0
- CS1000 5.5 and 6.0
- CS2000 CVM12 and CVM13
- CS2100 SE11 and SE13
- MCS5100 3.5 and 4.0 (with exception of SIP Refer)
- SCS2.0 and 3.0

H.323 interoperability supports the following products:

- BCM50 2.0 and BCM50 3.0
- BCM450 R1.0
- BCM200/400 4.0
- CS1000 5.5 and 6.0
- CS2000 CVM12 and CVM13

- CS2100 SE11 and SE13
- MCS5100 3.5

Hardware inventory

The Business Element Manager hardware inventory panel for BCM450 and the Entity management information base (MIB) provides a complete hardware inventory view of all BCM450 hardware components to the FRU level.

Proactive voice quality monitoring

With the proactive voice quality monitoring (PVQM) capability, you can set call-quality thresholds for IP sets and receive an alert and if these thresholds are exceeded. You can proactively identify voice quality of experience (QoE) issues for every call. In turn, you can troubleshooting of voice-quality issues within the network.

PVQM supports calls from an IP set to any other set or trunk. The measured call-quality metrics includes the following.

- packet loss
- inter-arrival jitter
- listening R-value
- RTCP round trip delay

With PVQM, a system-wide summary view of threshold-violation alert occurrences is maintained. Threshold violations can be sent as alarms and used by the central AppManager VoIP performance-monitoring product from NetIQ to generate a system-wide view of the voice quality of the network and to help diagnose voice-quality issues. The alarms include extensive call-quality information in accordance with IETF RTCP-XR RFC 3611.

PVQM on BCM

- provides the ability to monitor the quality and integrity of IP-based voice networking
- is a significant differentiator in VoIP convergence network sales with its market-leading, proactive focus on every call.
- mitigates customer issues to determine whether the data network or the BCM is at fault when call-quality issues situations occur
- provides consistency in the QoE solution across Nortel enterprise call servers to facilitate mixed network deployments

Ad Hoc conferencing

Currently, the BCM supports three-party conferencing. Ad-Hoc Conferencing extends this capability to support multi party conferencing.

Ad-Hoc conferencing

- provides a user interface model which is similar to the current F3 conference

- ensures no impact on the user's feature button footprint (that is, no requirement exists for additional IC keys or for an additional feature key)
- provides the current three-party conferencing capabilities, allowing users the flexibility to have larger multi-party conferences
- BCM450 supports up to 124 simultaneous participants on up to 62 conferences. BCM 50 supports up to 18 simultaneous participants on multiple conferences.

Meridian Customer Defined Network Trunk Anti-Tromboning with integrated applications

The BCM currently uses Meridian customer-defined network (MCDN) signaling to optimize network–resource use to transfer or forward station-to-station calls. With this feature, voice mail and autoattendant applications can use MCDN capabilities to optimize network use.

MCDN trunk anti-tromboning (TAT) on BCM 5.0

- provides customers with optimal use of trunk facilities
- enables a large number of feasible networking scenarios to serve customers

With MCDN TAT, BCM can determine whether calls routed across a network by the integrated AutoAttendant or Voicemail should invoke TAT or Trunk Route Optimization (TRO) MCDN to optimize the trunking network connection.

Session initiated protocol

BCM supports H.323 and SIP VoIP basic call communication for BCM-to-BCM calls. Both SIP and H.323 can leverage the same features that Nortel Voice Networking (MCDN) capability provides.

Existing supported SIP features include:

- SIP REFER (incoming only)
- SIP proxy failover
- RFC 2833 locating SIP Servers using DNS (RFC3263)
- SIP Trunk Authentication
- T.38 and G.711 Fax over IP support
- SIP registration

The Nortel voice networking (MCDN) supported features include:

- Private Name/Number
- Network Call Redirection Info (NCRI)
- Trunk Anti-Tromboning (TAT)
- ISDN Call Connection Limit (ICCL)
- Message Waiting Indication (MWI)
- Trunk Route Optimization (TRO)

In enterprise network systems, the SIP feature supports private numbering plans, optimizes the use of network traffic (TAT/TRO/ICCL), and supports centralized voice mail applications (NCRI, MWI) using the SIP messaging protocol. By making these capabilities available using the SIP protocol, you can begin to transition your network to the latest standard.

Terminal and mobility support

BCM 5.0 supports the following phones:

- IP Phone 1100 series
- IP Phone 1200 series phones
- T7406E Cordless Handset
- IP Audio Conference Phone 2033
- IP Key Expansion Module I24
- IP 1100 series key expansion module
- IP 1200 series key expansion module
- IP 12000 series key expansion module with Display
- DECT 4100 series handsets
- Digital mobility 7400 series phones
- WLAN 6120/6140 series phones
- IP 2000 series IP phones

For additional terminal and mobility supported devices, see the "BCM compatibility matrix" on page 77.

Global markets

BCM voice prompts, which were introduced in BCM 4.0, include Polish, Finnish, Korean, Turkish, and Czech.

The following additional capabilities are available:

- addition of second dial tone for PRI/BRI
  - In some markets, a PBX must provide a local tone to the originating party (as opposed to the central office).
  - This feature adds the ability to provide the local tone.
- increased public received digit length from 7 to 12 digits
  - Some markets require more than public received digits to support dial plans.

Analog interfaces are not supported in the following market profiles: Denmark, France, Germany, Holland, Italy, Norway, Spain, Sweden, and Switzerland.

Table 7"Analog interface availability by market profile" (page 50) shows analog interface availability by market profile.

Table 7 Analog interface availability by market profile

Market profile	ASM/ ASM8	ASM8+	GASM8	GASI	CTM4/ CTM8	Legacy GATM4/ GATM8	New GATM4/ GATM8	Legacy 4X16	G4x16 G8x16 (new)	GATI	ADID
Australia		✓✸	✓	✓		✓	✓		✓	✓	
Bahrain		✓✸					✓		✓	✓	
Brazil						✓	✓		✓	✓	
CALA			✓	✓	✓✸	✓	✓	✓✸	✓✸	✓ ✸	
Canada	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Caribbean			✓	✓	✓	✓	✓	✓	✓	✓	✓
Global	✓✸	✓✸	✓✸	✓	✓✸	✓✸	✓✸	✓✸	✓✸	✓ ✸	
Hong Kong	✓✸	✓✸	✓✸	✓ ✸	✓✸	✓✸	✓		✓	✓	✓
Ireland			✓	✓			✓		✓	✓	
Italy			✓	✓		✓	✓		✓✸	✓	
Malaysia			✓✸	✓✸		✓	✓		✓	✓	
Mexico			✓✸			✓	✓		✓	✓	
New Zealand		✓✸	✓	✓		✓	✓		✓	✓	
North America	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Poland	✓✸	✓✸	✓	✓		✓	✓		✓	✓	
PRC					✓✸	✓✸	✓		✓	✓	
Russia							✓		✓	✓	
Saudi Arabia			✓✸	✓✸		✓	✓		✓	✓	
Singapore			✓✸	✓✸		✓	✓		✓	✓	
South Africa			✓	✓		✓	✓		✓	✓	
Spain			✓	✓		✓	✓		✓	✓	
Taiwan					✓✸	✓	✓		✓	✓	✓

Table 7 Analog interface availability by market profile

Market profile	ASM/ ASM8	ASM8+	GASM8	GASI	CTM4/ CTM8	Legacy GATM4/ GATM8	New GATM4/ GATM8	Legacy 4X16	G4x16 G8x16 (new)	GATI	ADID
Turkey			✓	✓		✓	✓			✓	
United Kingdom	✓✸	✓✸	✓	✓		✓	✓		✓	✓	

Table 8"Digital interface availability by market profile" (page 51) shows the digital interfaces supported in each market profile. Note that the Digital Station Interface and the BRI cNIC are onboard interfaces.

Table 8 Digital interface availability by market profile

Market profile	DSM16+/ DSM32+	Digital station interface	BRI	BRI cNIC	DTM	R2MFC
Australia	✓	✓	✓	✓	✓	
Bahrain	✓	✓	✓	✓	✓	
Brazil	✓	✓	✓		✓	
CALA	✓	✓	✓		✓	✓
Canada	✓	✓	✓	✓	✓	
Caribbean	✓	✓	✓	✓	✓	
Denmark	✓	✓	✓	✓	✓	
France	✓	✓	✓	✓	✓	
Germany	✓	✓	✓	✓	✓	
Global	✓	✓	✓	✓	✓	✓
Holland	✓	✓	✓	✓	✓	
Hong Kong	✓	✓	✓		✓	
Ireland	✓	✓	✓	✓	✓	
Italy	✓	✓	✓	✓	✓	
Malaysia	✓	✓				
Mexico	✓	✓	✓		✓	✓
New Zealand	✓	✓	✓	✓	✓	
North America	✓	✓	✓	✓	✓	
Norway	✓	✓	✓	✓	✓	
Poland	✓	✓	✓	✓	✓	
PRC	✓	✓	✓		✓	

Table 8 Digital interface availability by market profile

Market profile	DSM16+/ DSM32+	Digital station interface	BRI	BRI cNIC	DTM	R2MFC
Russia	✓	✓				
Saudi	✓	✓				
Singapore	✓	✓				
South Africa	✓	✓				
Spain	✓	✓	✓	✓	✓	
Sweden	✓	✓	✓	✓	✓	
Switzerland	✓	✓	✓	✓	✓	
Taiwan	✓	✓	✓		✓	
United Kingdom	✓	✓	✓	✓	✓	

For additional information about the market profile attributes for your BCM system, refer to the market profiles reference in *Nortel Business Communications Manager 5.0 Configuration—System* (NN40170-501).

Set templates

Element Manager administrators can use this feature to configure multiple telephone sets by propagating the information and modifications through the template. You can combine a number of set parameter settings into a template. You can add a number of set models to a template for buttons programming. You can also include voice mail box as part of the template. This creates a voice mailbox for the sets that are associated with a template. You can then assign those parameters to appropriate sets on the BCM. You can use the template import and export feature or the BCM Backup and Restore feature to achieve template portability.

You can create templates in three ways:

- as an original template
- from a set (DN)
- from an existing template, including the default DID or PBX templates

Parameter renumbering

Use the Element Manager to quickly renumber specific parameters in the sets and lines configuration. The following list shows the parameters that you can renumber using a template:

- DNs
- Public OLI
- Private OLI

- Target Line Assignments
- Public Received Digits
- Private Received Digits

When you renumber DNs, all related parameters, such as the DN name, also change to match the DN. When you renumber DNs and the set has a voice mailbox, it is possible to also renumber the mailbox. In this case, the mailbox is deleted and a new one is created using the same parameters that existed for the old mailbox, with the exception of the extension. The extension field is set to the new DN created by renumbering process.

Chapter 7
Support, security, and servicing

The information in this chapter applies to both the BCM50 and the BCM450 platforms running BCM 5.0.

BCM provides solutions for client support, replacement parts, upgrades, and enhanced servicing.

Client operating system support

In general, BCM PC-based applications support Microsoft Windows XP Professional, Windows Vista, Windows Server 2003, and Windows Server 2008. Business Element Manager also supports Citrix Presentation Server 4.0 on Windows 2003 Server (All Editions). For the Unified Messaging Client, Citrix MetaFrame XP, Citrix Presentation Server 3.0, and Citrix Presentation Server 4.0 are also supported on Windows Server 2003 (All Editions). BCM applications for BCM 50/450 5.0 support the following Vista versions: Microsoft Vista Business, Microsoft Vista Ultimate and Microsoft Vista Enterprise. For more information about BCM Microsoft Vista support, see "Microsoft Vista operating system" on page 63.

Field replaceable units

BCM450

Field replacable units (FRU) include primary and secondary hard disk drives, primary and secondary fans, Universal Power Supply module, redundant power supply module, and the Base Function Tray. For more information on replacing FRUs, see *Nortel Business Communications Manager 450 5.0 Maintenance* (NN40170-503).

BCM50

Field replaceable units (FRU) strategy is consistent with previous BCM50 systems, including a replacement router, hard disk drive, and a BRI CDC card. CDCs are not hot-pluggable.

Servicing for BCM50

Serviceability enhancements in BCM50 include the following:

- BRI CDC offered as a FRU
- reduced dependency on DIP switches for Media Bay Modules as global profiles are downloadable

Chapter 8
BCM management

The information in this chapter applies to both the BCM50 and the BCM450 platforms running BCM 5.0.

You can quickly and easily install, configure, and administer BCM. These topics summarize the BCM management areas:

- "Ease of installation"
- “Remote management accessibility” on page 58
- “On-box and device manageability features” on page 59
- “Log management” on page 59
- “Set-based administration” on page 60
- “Business Element Manager” on page 60
- “Keycodes” on page 62
- “Network Configuration Manager” on page 63
- “Microsoft Vista operating system” on page 63

Ease of installation

BCM installation is easy with innovative hardware and management tools.

The simple nature of BCM physical installation, with the multipurpose RJ-45-based connector strategy, provides easy installation. The dedicated RJ-45 port for management access provides easy access to the unit for on-site PC-based element management tasks.

You can perform all configuration using the “Business Element Manager” on page 60.

BCM50

For BCM50 installations that require data networking, IP sets, or VoIP trunking, BCM50 can function as a DHCP client to a network DHCP server for automated IP address assignment. BCM50 can also function as a DHCP server to provide both IP phones and a directly connected Element Manager PC with the IP configuration.

Startup profile

To accelerate the initial installation programming of system-level parameters, you can use the Startup Profile to quickly place the BCM in a basic operational state, ready to program, without having to use Element Manager or set-based administration.

The Startup Profile is an easy-to-use template you can datafill using Microsoft Excel. The Startup Profile provides a quick interface to define, for example, the following parameters:

- system profile including country, telephony template, and key voice mail attributes
- system IP parameters
- system-level telephony attributes to automatically create the system DNs
- keycode information through automated application of keycodes
- users and groups

You fill out the template, save it to a USB storage device, and insert the memory stick into the USB port of the BCM during the initial startup of the system. This information is read into the BCM and applied during a single restart sequence.

BCM Release 5.0 users should note that the Startup Profile is similar to the Quickstart wizard of the BCM200 and BCM400, but it can be datafilled and applied without an IP connection to the unit, a PC, or telephone. The Startup Profile executes quickly, and includes a broad scope of system-level parameters.

Remote management accessibility

BCM has an integrated analog modem that can accept an incoming modem call on any BCM system line. You can configure the BCM system to have the modem automatically answer a specific line with configuration options. You can manage from BRI. Remote users can also initiate a voice call to a person or an autoattendant, who transfers the call to the modem.

The analog modem also supports callback for management access to the BCM, which can be used to support automatic dial-out on SNMP traps and automated sending of Call Detail Records (CDR) to a remote CDR collection point. The modem is also enhanced with CLID.

Although Nortel does not recommend that you use the analog modem to transfer large files, the modem provides a flexible method of remote access to remotely perform all programming tasks.

BCM50 and BCM450 Release 5.0 also include 2 ISDN interfaces. ISDN uses existing analog telephone wires to multiplex data into separate digital channels, which increases bandwidth. ISDN uses a single transport to carry multiple information types. Where you once required separate networks for voice, data, images, or video conferencing, it now combines into one common high-speed transport.

The default IP address for both interfaces is 10.11.16.1. The default configuration for ISDN dial-in is for the BCM to assign the first ISDN interface an address of 10.10.18.1 and the second client an address of 10.10.18.2. If the default of either interface is already being used, both interfaces have to be reconfigured. The first remote client is assigned 10.10.18.10 and the second client is assigned 10.10.18.11. The settings can be changed to have the remote clients assign themselves an address or even assign the BCM an address.

Finally, an administrator has the capability to disconnect a modem or ISDN call if they find that a modem or ISDN call is in progress.

BCM50

The BCM50e and BCM50a provides remote management capability with a high-speed connection. Tasks such as transferring backup files to a remote destination and transferring software update files, CDR records, and log files can occur more efficiently than over the analog modem.

On-box and device manageability features

BCM has an SNMPv3 interface that includes support for SNMP v1 and v2 for management by legacy SNMP managers. SNMPv3 delivers improved security features for SNMP device access.

The BCM main unit supports the following versions of SNMP:

- SNMP v1—the first implementation of SNMP; this version supports protocols such as IP
- SNMP v2C—provides improved efficiency and error handling
- SNMP v3—provides improvements in security and privacy

Using the BCM Element Manager, you can select which versions of SNMP you want the BCM agent to support.

Management Information Bases (MIB) provide access to the managed objects of a system and specify the format of traps. BCM supports these standard MIBs for remote management:

- MIBII RFC 1213—second version of the MIB for use with network management protocols in a TCP/IP-based internet. This MIB includes System Group and Interfaces Group and is a baseline RFC implemented by data-networking systems.
- Entity MIB RFC 2737—describes managed objects used to manage multiple logical and physical entities to manage by a single SNMP agent.
- System Host MIB RFC 2790 MIB for to manage host systems — defines a set of objects common across many computer system architectures that are useful to manage host computers, such as memory and CPU.
- SmallSiteEvent MIB for traps.
- RFC 2261—SNMP Framework MIB.

BCM adopts the Common Information Model (CIM) standard according to the industry standards organization Distributed Management Task Force (DMTF), which provides a modeled method to manage system-programming parameters. BCM uses the transport mechanism CIM operations over HTTP using XML, also referred to as CIM-XML. The BCM CIM-XML interface provides a consistent way to manage data on the device, whether by the BCM Element Manager, NCM, or third-party network or service-management applications.

Log management

The following sections outline log management for the BCM 450 and the BCM50.

BCM 5.0 logs are grouped in three categories:

- operational logs

- diagnostic logs
- sensitive logs

Operational logs are meant to be used by customers and channel partners to debug and diagnose issues for the BCM. Diagnostic and secure logs are used by Nortel for troubleshooting. Diagnostic and secure logs have been encrypted to ensure that the customer and channel partner data is protected.

Operational logs include:

- alarms.systemlog - a log that contains alarm and information events
- configchange.systemlog - a log that tracks administrative operations

Set-based administration

BCM gives you the ability to use a telephone interface to program much of the BCM system. Set-based administration benefits include:

- BCM installations that have no TCP/IP connectivity
- BCM installations where the installer has no on-site access to a computer
- installers who prefer the speed of programming using set-based administration
- installers who are familiar with the Norstar interface

With set-based administration, you can manage

- core telephony
- voice mail services
- IP network settings
- admin password change
- modem on or off

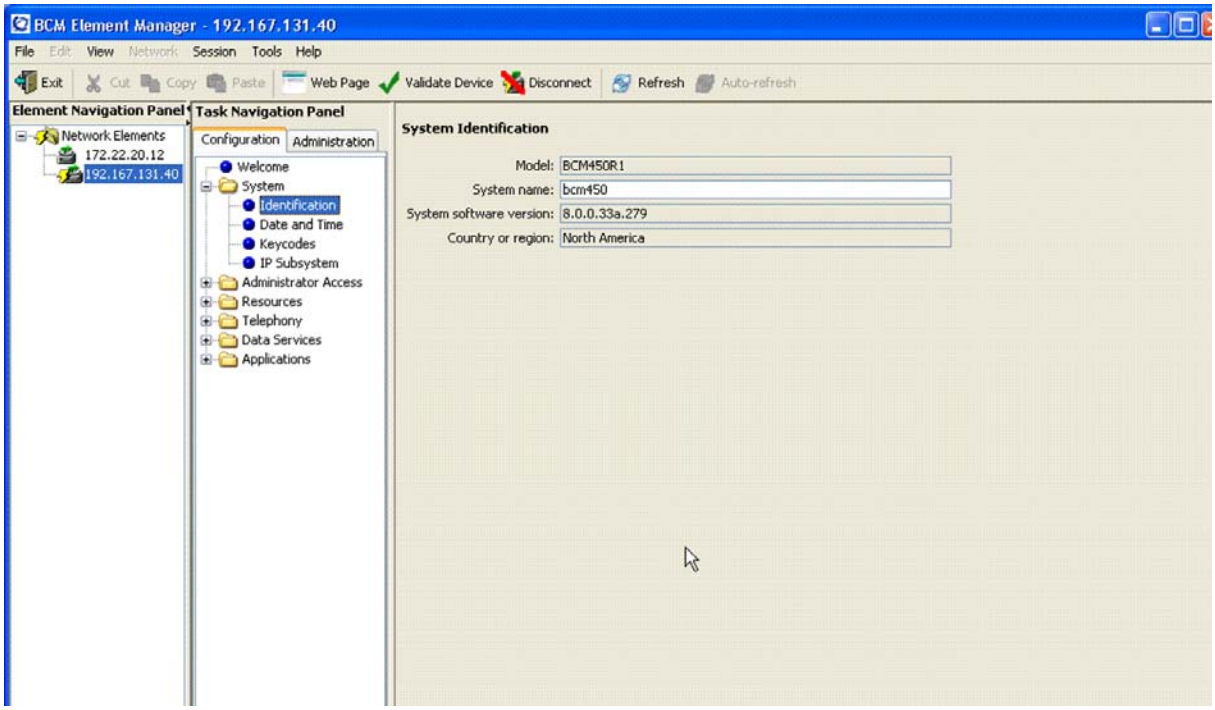
Support is available for multiple languages, consistent with Norstar set-based administration.

Business Element Manager

Business Element Manager provides access to BCM information in an off-box management architecture. With Business Element Manager you can access any programming screen in three or fewer mouse-clicks.

Programming data is enhanced in the Element Manager to quickly show all the associations between data in the form of tables. This eliminates looking in multiple places to obtain a system view of the programming.

Figure 14 Business Element Manager interface



Element Manager runs on a PC, and the information required to draw the screens is contained locally within the client application. The only data transferred between Element Manager and the BCM are queries and actual data. Element Manager has familiar Microsoft Office-like capabilities, such as the ability to sort information.

Element Manager integrates all the traditional BCM administration tools, including managing backups and software updates.

Element Manager has an element navigation panel to organize a network of elements. You can simultaneously manage multiple elements. After you connect to an element, you can perform configuration and administration tasks.

Business Element Manager administration interface

The Element Manager administration management environment includes

- BCM diagnostic and maintenance tools, including access to BCM Monitor.
- Fault management for viewing BCM alarms. You can set which alarms are displayed in the Element Manager alarm browser and which alarms trigger an SNMP trap.
- Log management for off-box transfer of logs, including component logs and administrator logs such as alarm log, security log, configuration change log, and system log.
- Software management tools for software updates (for example, for corrective software) and software upgrades.

- Backup and restore. You can schedule full back ups with the option of excluding certain components which are presented in the user interface. A scheduled backup provides the ability to routinely perform a backup, which you can save on the BCM hard drive or transfer to an off-box destination such as network folder, FTP server, or locally attached USB storage device.

For backup and restore, software management, and log management, a flexible set of source and destinations is supported along with protocols to access them. For example, you can save backups from the BCM to either the USB port, the Element Manager client PC (on-demand only), a shared drive available on the network, or a remote FTP server.

Software updates

To ensure that BCM maintenance costs are low, even in an environment of security and corrective content updates, the BCM handles software updates as follows.

Note that you can apply the Factory Backup Image with a Level 2 reset, which overwrites the current installed software on the BCM.

- You can download software updates to the BCM, either on-demand or according to a schedule, from a USB port, a shared network drive, a remote FTP server, or a client PC.
- Update software is automatically checked against the BCM software history and validated before you transfer it
- You can schedule the software update separately. For example, you can schedule a download for Tuesday night, but you can schedule the application for Friday at 2:00.
- You can program multiple software-update packages to be applied at the same time.
- One software-update package can include updates for multiple software components. While many software updates do not require a system restart, some software components require a restart for the update to take effect. No more than one system restart is required if one or more of the software components being updated by the software-update package requires a reboot.
- Software upgrades are handled in the same way and use the same tool as software updates.
- You can set up the entire software-update process for hands-off operation if the software content can either be downloaded remotely or sent and installed from the USB port.

Keycodes

The BCM keycode structure includes the following capabilities:

- One keycode validates all feature entitlements, which simplifies installation.
- You can apply keycodes in a number of ways:
  - through Element Manager
  - through NCM
  - through a USB memory stick

Network Configuration Manager

Many Business Communications Manager customers already use the optional client/server-based management application Network Configuration Manager (NCM) to manage their multisite BCM200/400 network. Designed to provide a system-wide perspective for up to 2000 BCM devices, NCM is a centralized database that stores information about every Business Communications Manager device on your network.

NCM for (BCM) 50/450 5.0 includes centralized backup and restore management, common file distribution (for example, system greeting files), parameter configuration, and automated software-update distribution. You can manage large (BCM) 50/450 5.0 networks and mixed BCM50/200/400 networks using the NCM.

Microsoft Vista operating system

BCM applications for (BCM) 50/450 5.0 support the following Vista versions: Windows Vista Business, Windows Vista Ultimate, and Windows Vista Enterprise. BCM applications support both 32-bit and 64-bit versions of Windows Vista, except for the following limitations:

- The CTE TAPI option is not supported by the 64-bit version of Windows Vista (x64).
- Personal Call Manager is not supported by the 64-bit version of Windows Vista (x64).
- Reporting for Contact Center is not supported by the 64-bit version of Windows Vista operating systems.
- CallPilot Desktop Messaging 4.0 does not support Groupwise 7.x on Windows Vista operating systems.
- The IP SoftPhone 2050 is not supported by the 64-bit version of Windows Vista operating systems.
- VPN client is not supported by the 64-bit version of Windows Vista operating systems.

BCM application	Vista compatible
Activity Reporter and Activity Reporter Basic	Yes
Business Element Manager	Yes
BCM Monitor	Yes
CDR	Yes
CDR Pull Client	Yes
CDR Livestream	Yes
Desktop Assistant Pro	Yes, with exception. See WinHlp32.exe help file exception (page 65)
Digital Mobility Controller	Yes
Digital Mobility Service Tool	Yes
IP Softphone 2050	Yes (32-bit version only)
IP client 2050 v2 and QoS	Yes

BCM application	Vista compatible
ipView Software Wallboard Setup and Operation Guide	Yes
LAN CTE	Yes
LAN CTE Client	Yes
LAN CTE TAPI Service Provider	Yes (32-bit version only)
NCM (server and client)	Yes
BCM50 only, VPN	Yes, Nortel VPN Client v6.07 (32-bit version only). See WinHlp32.exe help file exception (page 28) and VPN exceptions (page 28) for known issues.
Personal Call Manager	Yes (32-bit version only)
Reporting for Contact Center	Yes
SSH Client	Yes
Startup Profile Template	Yes
Unified Messaging Client	Yes, with exception. See Unified Messaging Client exceptions (page 65)
Call Pilot Manager	Yes
Multimedia Contact Center (agent and caller)	Yes
BCM50 only, Mailbox Manager	Yes
InTouch	Yes

BCM application	Vista compatible
Mailbox Manager	Yes

WinHlp32.exe help file exception

WinHlp32.exe, previously used to display the help files (.hlp files), is not included in Microsoft Windows Vista. The Windows Help program does not ship as a component of Vista. Also, third-party programs that include.hlp files are prohibited from redistributing the Windows Help program with their products. To view 32-bit .hlp files, you must download the program from the Microsoft Download Center, and then install it on your computers.

VPN exceptions

The Nortel VPN Client for Vista has the following limitations:

• The Nortel VPN Client must be run as an administrator. UAC always prompt for elevation when it runs.

• The VPN Client installs and runs only as an application. This is due to Vista services hardening and the deprecation of the GINA infrastructure.

• Support exists only UDP encapsulation. This is due to changes in the Microsoft stack, which prevents ESP packets from reaching the VPN driver as it is currently implemented. Enable UDP encapsulation in the Contivity switch group profile. For Vista users, the NAT Traversal setting must have any value other than Not Allowed.

Unified Messaging Client exceptions

The Unified Messaging Client requires a new compatible fax driver from ImageMaker.

CallPilot Desktop Messaging 4.0 does not support Groupwise 7.x on Vista. You can download Windows Help that is used by CallPilot help from the Microsoft Download Center. The Desktop Messaging installation can appear to be stalled for several minutes when you are completing the installation process.

Vista Windows Mail purge messages fails because of Microsoft limitations. To avoid this failure and keep deleted messages in your Inbox, navigate to Tools > Options > Advanced. Deselect the Use the Deleted Items Folders with IMAP accounts check box. To show deleted messages in your Inbox, navigate to View > Current View. Select the Deleted Messages check box

Chapter 9
BCM applications

The information in this chapter applies to both the BCM50 and the BCM450 platforms running BCM 5.0.

BCM has a wide range of applications. You enable these applications through keycodes, and you require no additional hardware.

BCM provides 10 ports to connect to CallPilot and Intelligent Contact Center. Each port supports one connection to an application. For example, four callers can leave voice messages, and two callers can be in the autoattendant, while four callers listen to voice messages. The number of ports can support a fully configured a BCM system with a full complement of voice mailboxes.

BCM is delivered with Mailbox Manager and CallPilot. Keycoded CallPilot options are also available, as are other BCM applications, such as Meet-Me Conferencing, LAN CTE, Personal Call Manager, and Call Detail Recording.

Meet-Me Conferencing

Meet-Me Conferencing provides feature-rich, high density conferencing capabilities for BCM users. Designed to provide a more sophisticated feature set for formal conference calls, Meet-Me Conferencing allows parties to establish a teleconference by calling in to a specified bridge number at an agreed on time. One party acts as the chairperson and has additional powers to start, stop, secure and control the conference.

Conferences are initiated by calling in to the system on designated lines or to a specified directory number. The service responds by prompting the caller for the conference ID and optional pass-code. The caller then receives music-on-hold until the chairperson starts the conference. At that point, a multiway voice conference is established with all parties in the conference.

Mailbox Manager

You can use Mailbox Manager to administer the following features through a browser:

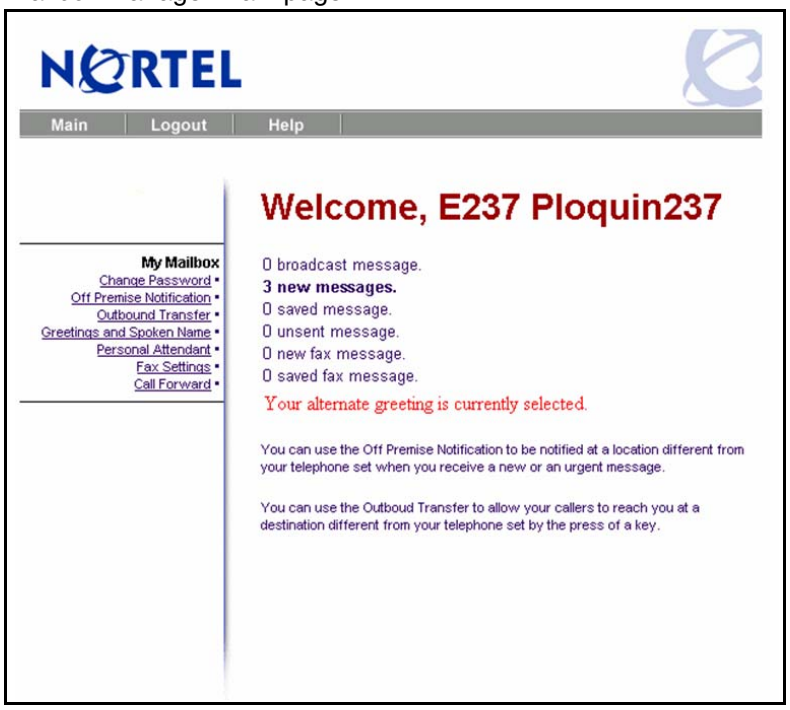
- Off Premise Notification settings
- Password
- Outbound transfer settings
- Spoken name (import, export, play and record)
- Primary, Alternate, and Personal Greetings (import, export, play, and record)
- Personal Attendant DN

- Fax settings (if fax messaging keycode is applied)
- Call forward to voice mail and display CLID

Note: You can administer same items with F981. Currently, you can administer only subscriber mailboxes, the general delivery mailbox, and the system administrator mailbox through the Mailbox Manager application.

The main page shows your mailbox status information, such as whether the telephone is forwarded, the mailbox is full, the number of broadcast messages, new messages and how many are urgent, saved messages, unsent messages (if you use the CallPilot user interface), new fax messages, and saved fax messages. A warning appears about an Off Premise Notification destination and the outbound transfer having failed. If you use the alternative greeting, an indication of its use is presented with an indication of whether messages are being accepted.

Figure 15 Mailbox Manager main page


NORTEL
Main
Logout
Help
Welcome, E237 Ploquin237
My Mailbox
Change Password
Off Premise Notification
Outbound Transfer
Greetings and Spoken Name
Personal Attendant
Fax Settings
Call Forward
0 broadcast message.
3 new messages.
0 saved message.
0 unsent message.
0 new fax message.
0 saved fax message.
Your alternate greeting is currently selected.
You can use the Off Premise Notification to be notified at a location different from your telephone set when you receive a new or an urgent message.
You can use the Outboud Transfer to allow your callers to reach you at a destination different from your telephone set by the press of a key.

Mailbox Manager features

My Mailbox

Information about the mailbox includes the number of each type of messages (if more then one message) and other information related to the state of the mailbox, including

- The number of broadcast messages.
- The number of new messages. If one or more is urgent, this information is specified.

- The number of unsent messages.
- The number of saved messages.
- The number of new fax messages (if the fax keycode is applied).
- The number of saved fax messages (if the fax keycode is applied).
- Warning messages that appear in red if
  - an extension is specified for the mailbox, but no telephone is associated with the extension
  - the telephone is currently forwarded
  - an off-premise notification is not allowed
  - the outbound transfer is not allowed
  - the alternative greeting is selected
  - messages are not accepted
  - the mailbox is full

Also, My Mailbox displays useful messages to help you familiarize yourself with lesser-known features:

- You can use the Off Premise Notification to be notified at a location different from your telephone when you receive a new or an urgent message.
- You can use the Outbound Transfer to allow your callers to reach you at a destination different from your telephone by the pressing a key.

Off Premise Notification

Use Off Premise Notification (OPN) to enter a destination that can be an extension, an external number, or a pager number. You can turn notifications on or off, apply start and end times, and select a message type.

Outbound Transfer

You can enter an extension number as your outbound transfer destination or a telephone number to for outbound calling.

Greeting and Spoken Name

You can use the greetings and spoken name page to record or re-record your spoken name, standard greetings (primary and alternative), and three personalized greetings. For each spoken name and greeting, a guide text informs you whether the spoken name and greeting are recorded.

Personal Attendant

You can select the system attendant as your personal attendant (default setting), or you can enter a specific extension.

Fax Setting

Use the Fax Setting page to enter a destination where faxes can be printed. The destination can be an extension or a telephone number, if outcalling is enabled. For users without the outcalling capability, you can enter only an extension on the Fax Setting page.

Call Forward

You can use the Call Forward page to forward your phone to voice mail. When you forwarded the telephone to voice mail, you can view the callers being forwarded to your mailbox on the telephone screen. You can select which calls you want to retrieve with F987.

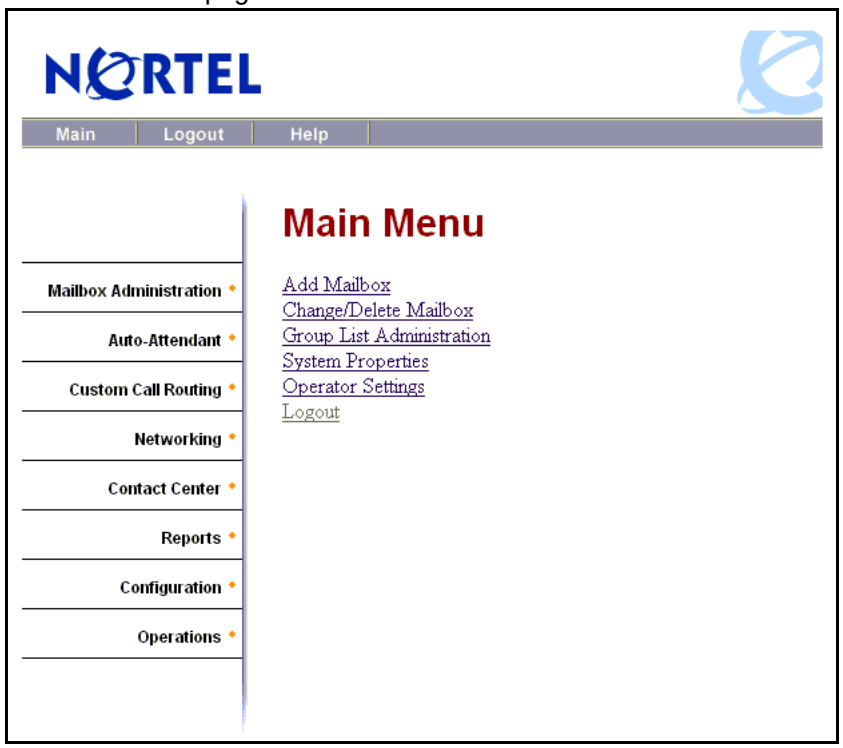
CallPilot

BCM Release 5.0 is a versatile business communications tool that you can use to

- answer incoming calls
- offer callers options to route their calls or to access information
- provide advanced voice mail, Auto Attendant, and call-handling capabilities

CallPilot Manager is a Web-based application that is accessible through the BCM Element Manager.

Figure 16 CallPilot main page



Features included with CallPilot

CallPilot for BCM Release 5.0 includes the following features.

Voicemail

The Voicemail feature records messages and stores them in a mailbox for easy retrieval. Business telephones on your system can have their own mailbox and greeting. You can quickly distribute information to departments and work groups.

Auto Attendant

Auto Attendant is the CallPilot answering service that promptly answers your business calls 24 hours a day with a company greeting, plays a list of options to callers, and performs call-routing functions in response to caller selections.

Custom Call Routing

Custom Call Routing (CRC) enhances the Auto Attendant menu with custom menus and information messages. With CCR, you can determine the menu commands and record the voice prompts that guide callers along call paths.

Fax Answering

Outside callers use Fax Answering to send faxes to the main site telephone number. Fax Answering is available even if you do not have the Fax option installed on your system. With Fax Answering, a fax call that arrives through the Auto Attendant or CCR is transferred to a specified extension.

CallPilot options

CallPilot has options that enhance your office communications. You need a keycode to enable a CallPilot option. Contact your vendor to purchase a software authorization code.

Message networking

Message networking links your BCM system with other voice mail systems and allows the exchange of voice messages between users at different sites. CallPilot supports Voice Profile for Internet Mail (VPIM) and Audio Messaging Interchange Specification (AMIS) networking.

For more information, see the *CallPilot Message Networking Set Up and Operation Guide*.

Fax

Fax is a CallPilot option that enhances your office communications by providing incoming and outgoing fax capability (two ports only). With Fax, callers can send and retrieve fax messages as easily as they send and retrieve voice messages. The Fax option includes Fax Mail, Fax On Demand, and Fax Overflow. Fax Answering is available even if you do not have the Fax option installed on your system.

For more information about Fax, see the *CallPilot Fax Set Up and Operation Guide*.

Unified messaging

With Unified messaging, you can use your e-mail application to access voice, fax, and text messages from your personal computer. You can use Unified Messaging with several popular e-mail application, including

- Microsoft Outlook 2002 (XP), Outlook 2003, and Outlook 2007 including Internet Mail Mode
- Lotus Notes 6.x, 7.x, and 8.x
- GroupWise 6.5, 7.0, and 7.0.1 (except on Windows Vista)
- Microsoft Outlook Express 6.x, and Windows Vista Mail

For more information, see the *Unified Messaging Configuration Guide*.

Intelligent Contact Center

Intelligent Contact Center (ICC) is an evolution of the existing Call Center capability on BCM. ICC has the same functionality as the current Professional Call Center with the ability to choose exactly the number of agents and skillsets that a customer or customer site requires.

The existing Intelligent Contact Center provides the following features:

- Provides maximum flexibility in granularity.
- Any combination of Agents and Skillsets within the boundaries of a platform. This combination confusing of features between Basic and Professional. Channel partners and customers need not to worry about which functionality belongs to which product.
  - — Contact Center with Professional Contact Center level of functionality.
- Simplifies product offering
  - — Contact Center, x skillsets, x agents, RCC
  - — Eliminates Basic, Pro, and upgrade between the two
- Increases market potential
  - — Customers that require more skillsets than agents

    Example: Real Estate — 3 receptionists (3 agents) answering telephones for 20 real estate agents (20 skillsets)
  - — Big-box retail — 3 receptionists (3 agents) answering telephones for 12 departments (12 skillsets).

Optional components include

- x agents (keycodes offer granular selection of the number of desired agents)
- x skillsets (keycodes offer granular selection of the number of desired skillsets)
- Reporting for CC
- Multimedia CC

For more information, see the *Intelligent Contact Center Set Up and Operation Guide*.

Multimedia Contact Center

Agents and callers can use the Multimedia Contact Center to participate in multimedia calls that include

- speaking over a Public Switched Telephone Network (PSTN) voice connection
- text chatting
- exchanging and viewing Web pages
- viewing screen captures (sent by an agent to the caller)

Multimedia Contact Center supports two call types:

- Phone-and-browser calls (using PSTN), which integrate a standard voice call with a Contact Center agent and a Multimedia Contact Center browser call session with follow-me browsing, text chat, and screen-capture push.
- Browser-only calls, which have the same browser features of phone-and-browser calls but no voice call component.

Local Area Network Computer Telephony Engine

BCM Computer Telephony Integration (CTI) products provide an interface between your personal computer and your BCM system. With these products, you can use telephony applications through the Windows operating system to control your telephone.

One BCM CIT software component is Local Area Network Computer Telephony Engine (LAN CTE). LAN CTE provides an interface between your personal computer, your telephone, and the BCM system. With LAN CTE installed on your computer, you can run LAN CTE or TAPI applications to communicate with and control your telephone.

For more information, see the *LAN CTE Configuration Guide*.

Call Detail Recording

Call Detail Recording (CDR) is an application that collects call activity. Each time a telephone call is made to or from your company, CDR can record information about the call. You can use the information CDR collects to create reports about call activity. CDR also provides an interface to third-party applications for call accounting and billing.

For more information, see the *Call Detail Recording System Administration Guide* (NN40020-605).

Personal Call manager

Personal Call Manager is a TAPI-based application that provides an easy-to-use interface between your computer and your telephone. You use the telephone to speak with a caller. You can customize your Address Book and your calls. Basic functions that Personal Call Manager performs include making and answering calls, placing calls on hold, transferring calls, and making conference calls.

For more information, see the *Personal Call Manager User Guide* (NN40010-104).

Find Me/Follow Me

Find Me/Follow Me allows simultaneous ringing of up to five different external destinations. Users and administrators can configure these destination numbers. You can configure Find Me/Follow Me based on the time and day by configuring schedules.

Using Find Me/Follow Me, you can pick up a call either at your primary extension (your desk phone for example) or at one of the five external destinations, such as a cell phone, your home phone, or another phone. When you answer the call at one destination the other alerting calls are disconnected. By doing this, the Find Me/Follow Me feature reduces the chance of missed calls. You can then transfer the answered call back and forth between your desk phone and other devices on your Find Me/Follow Me external destinations list. For more information about Find Me/Follow Me, see *Nortel Business Communications Manager Find Me/Follow Me Administration Guide* (NN40010-678) and *Nortel Business Communications Manager User Guide* (NN40010-118).

Professional Call Recording

The professional call recording feature records a call from the time that you request to record the call until the call ends. The feature supports recording a conference call hosted or joined by a DN. For more information about Professional Call Recording, see *Nortel Business Communications Manager 5.0 Configuration—Telephony* (NN40170-502).

Overview

- This feature does not allow voice and tone prompt to parties involved on a call during establishment of recording session.
- This feature allows recording of established calls on BCM. It supports multiple simultaneous recording of the same call.

- A maximum of 80 concurrent recording sessions are supported for BCM450 5.0 (with CEC) and maximum of 40 concurrent recording sessions are supported for BCM450 5.0 (without CEC) subject to engineering considerations.
- A maximum of 16 concurrent recording sessions are supported for BCM50 5.0.
- This feature supports recording of faxes. Faxes are treated as voice calls and recorded as audio.
- You need to buy a minimum of one Professional Call Recording keycode to enable the call recording feature.
- Nortel recommends you to consider the laws and legal restrictions when utilizing the Professional Call Recording feature.

InTouch

InTouch is a new feature that integrates with a user's Microsoft Outlook, and provides direct one-touch interaction between a user's telephony, email, calendar and instant messenger. InTouch brings together all popular forms of communications from within both Outlook and external contacts. InTouch appears as a contact list that is part of your Outlook screen. This is referred to as the "UC Activity Pane". Regardless of which Outlook page the user may have on their screen at any time (Mail, Calendar, Outlook Contacts or Tasks), the InTouch task panel will retain the same view and functionality.

For more information about InTouch, see *InTouch User Guide* and *InTouch Administration Guid*e.

Message Forwarding

With the Message Forwarding feature, mailbox owners can send an e-mail message when new or urgent voice messages arrive in their CallPilot mailbox. Message Forwarding can attach the voice or fax message to the forwarded e-mail message so users can play the voice message or view the fax on the destination device. For more information about Message Forwarding, see *Callpilot Manager Setup and Operation Guide* (NN40170-300).

Chapter 10
BCM compatibility matrix

The information in this chapter applies to both the BCM50 and the BCM450 platforms running BCM 5.0.

The following table indicates the compatibility of components and features through the BCM product line.

Table 9 BCM compatibility matrix

Component or feature	BCM 4.0	BCM50 3.0	BCM450 1.0	BCM50 5.0	BCM450 5.0
Operating system					
Nortel Carrier Grade Linux	Yes	Yes	Yes	Yes	Yes
Hardware					
Digital Terminals	Yes	Yes	Yes	Yes	Yes
T7000	Yes	Yes	Yes	Yes	Yes
T7100 and M7100	Yes	Yes	Yes	Yes	Yes
T7208 and M7208	Yes	Yes	Yes	Yes	Yes
T7316 and M7324	Yes	Yes	Yes	Yes	Yes
T7316e	Yes	Yes	Yes	Yes	Yes
T7406	Yes	Yes	Yes	Yes	Yes
T7406e	Yes	Yes	Yes	Yes	Yes
T24 KIM and CAP	Yes	Yes	Yes	Yes	Yes
Norstar Audio Conference Unit	Yes	Yes	Yes	Yes	Yes
Doorphone	Yes	Yes	Yes	Yes	Yes
IP Terminals					
IP Phone 2001	Yes	Yes	Yes	Yes	Yes
IP Phone 2002	Yes	Yes	Yes	Yes	Yes
IP Phone 2004	Yes	Yes	Yes	Yes	Yes
IP Phone 2007	Yes	Yes	Yes	Yes	Yes
IP Key Expansion Module 24	Yes	Yes	Yes	Yes	Yes
IP 11xx Key Expansion Module	No	3.0 Yes	Yes	Yes	Yes
IP 12xx Key Expansion Module	No	3.0 Yes	Yes	Yes	Yes
IP 12xx Key Expansion Module with Display	No	3.0 Yes	Yes	Yes	Yes
i2050 Softphone	Yes	Yes	Yes	Yes	Yes
IP Softphone 2050	No	Yes	Yes	Yes	Yes

Table 9 BCM compatibility matrix

Component or feature	BCM 4.0	BCM50 3.0	BCM450 1.0	BCM50 5.0	BCM450 5.0
IP Phone 2007	Yes	Yes	Yes	Yes	Yes
IP Phone 1110	No	Yes	Yes	Yes	Yes
IP Phone 1120e	Yes	Yes	Yes	Yes	Yes
IP Phone 1140e	Yes	Yes	Yes	Yes	Yes
IP Phone 1210/1220/1230	No	Yes	Yes	Yes	Yes
IP Audio Conference Phone 2033	Yes	Yes	Yes	Yes	Yes
WLAN Handsets					
WLAN 2210	Yes	Yes	Yes	Yes	Yes
WLAN 2211	Yes	Yes	Yes	Yes	Yes
WLAN 2212	Yes	Yes	Yes	Yes	Yes
WLAN 6120	No	No	Yes	Yes	Yes
WLAN 6140	No	No	Yes	Yes	Yes
MCS Card	Yes				
Expansion cabinet	1 Exp with 6 MBMs				
Applications					
Integrated IVR	Yes	No	No	No	No
IP Sets	64	32	300	32	300
IP Trunks	60	12	130	12	130
H.323 with MCDN	Yes	Yes	Yes	Yes	Yes
SIP	Yes	Yes	Yes	Yes	Yes
SIP with MCDN	Yes	Yes	Yes	Yes	Yes
Voice Mail ports	32	10	31 (63 with CEC)	10	31 (63 with CEC)
IP Music	Yes	Yes	Yes	Yes	Yes
Fax ports	2	2	2 (8 with CEC installed)	2	2 (8 with CEC installed)
IP Trunks Codecs					
Management					
NCM	NCM 5.0	NCM 5.0	NCM 5.0	NCM 5.0	NCM 5.0
NetIQ support	Yes	Yes	Yes	Yes	Yes
System Set-Based Admin (F9*8)	Yes	Yes	Yes	Yes	Yes
Element Manager	Yes	Yes	Yes	Yes	Yes
Set-Based Admin					

Table 9 BCM compatibility matrix

Component or feature	**BCM 4.0**	**BCM50 3.0**	**BCM450 1.0**	**BCM50 5.0**	**BCM450 5.0**
Telephony	Yes	Yes	Yes	Yes	Yes
CallPilot	Yes	Yes	Yes	Yes	Yes
PVQM	Yes	Yes	Yes	Yes	Yes
BCM Monitor					
POST					
Applications					
LAN CTE	Yes	Yes	Yes	Yes	Yes
CDR	Yes	Yes	Yes	Yes	Yes
Meet-Me Conferencing	No	Yes	Yes	Yes	Yes
Activity Reporter	No	Yes	Yes	Yes	Yes
Mailbox Manager	Yes	Yes	Yes	Yes	Yes
Operator MB Manager	Yes	Yes	Yes	Yes	Yes
Intelligent Contact Center					
Basic Contact Center	Yes	Yes	Yes	Yes	Yes
Professional Contact Center	No	No	No	No	No
Reporting for Contact Center	Yes	Yes	Yes	Yes	Yes
Multimedia Contact Center	Yes	Yes	Yes	Yes	Yes
Silent Record-a-Call	No	Yes	Yes	Yes	Yes
Find Me/Follow Me	No	No	Yes	Yes	Yes
InTouch	No	No	No	Yes	Yes
Professional Call Recording	No	No	No	Yes	Yes
UPS support	Yes	Yes	Yes	Yes	Yes
Backup and Restore	Yes	Yes	Yes	Yes	Yes
Upgrade from previous version	Yes	Yes	Not available	Yes	Yes
BCM Imaging Tool	Yes	No	No	No	No
Level 1 and 2 Reset	No	Yes	Yes	Yes	Yes
Wireless					
T7406 and T7406e	Yes	Yes	Yes	Yes	Yes
802.11b WVoIP i22xx	Yes	Yes	Yes	Yes	Yes
Digital Mobility	Yes	Yes	Yes	Yes	Yes
Data services					
Firewall	Yes	Yes	No	Yes	No
ISDN Dial-up	Yes	Yes	Yes	Yes	Yes
ADSL					

Table 9 BCM compatibility matrix

Component or feature	BCM 4.0	BCM50 3.0	BCM450 1.0	BCM50 5.0	BCM450 5.0
Integrated ADSL Modem	No	Yes	No	No*	No
VPN					
IPsec Client	Yes	Yes	No	No	No
IPsec Branch	Yes	Yes	No	No	No
PPTP	No	No	No	No	No
DHCP Client	Yes	Yes	Yes	Yes	Yes
DHCP Server	Yes	Yes	Yes	Yes	Yes
DHCP Relay	Yes	Yes	No	No	No
NAT	Yes	Yes	Yes (only on dial-up interfaces)	Yes (only on dial-up interfaces)	Yes (only on dial-up interfaces)
Routing Protocols	Yes	Yes	No	No	No
QoS	Yes	Yes	Yes (only VoIP DSCP marking. Default values cannot be changed)	Yes	Yes (only VoIP DSCP marking. Default values cannot be changed)
Dial Back-up	Yes	Yes	Yes	Yes	Yes
SNMP					
*BCM50a systems sold on previous releases can be upgraded to Release 5.0					

BCM50 hybrid configuration

A BCM50 system is defined as a hybrid configuration if it is configured with a mix of IP phones, IP clients, or IP trunks and with non-IP phones, terminals, or trunks (digital phones, analog phones, FAX machines, digital T1/E1/PRI trunks, BRI interfaces, and analog trunks).

For a BCM50 system deployed in a hybrid configuration, it is recommended that the total number of stations (digital phones, IP phones, analog terminals, BRI B channels for station side) not exceed 50. Additional stations can reduce the performance effectiveness of the BCM50.

If you use Meet Me Conferencing, Nortel recommends you increase the number of voice mail plus Call Centre (Voice Mail + CC) resources from 10 to 15.

When the number of voice mail plus Call Centre resources exceeds 10, the following engineering rule applies:

- For a BCM50 system deployed in a hybrid configuration, if the number of voice mail plus Call Centre resources required exceeds 10 (maximum 15) and the trunks use the G.729 codec, the number of IP trunks must not exceed 10.

- The number of IP trunks may number 12 if the trunks are configured with the G.711 codec.